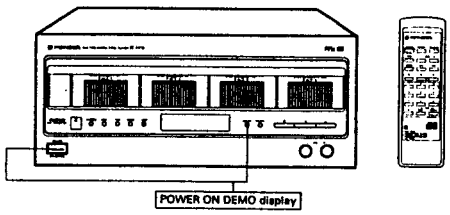
PIONEER®
The Art of Entertainment

PION-04463

Service Manual



ORDER NO.
RRV1225

FILE-TYPE COMPACT DISC PLAYER

PD-F904

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD−F904		
KU/CA	○	AC120V	

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

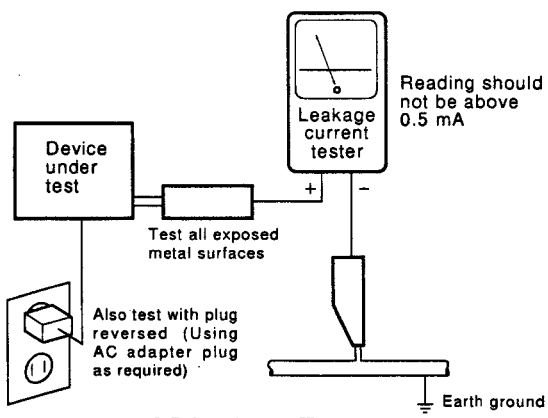
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.


Leakage current tester
Reading should not be above 0.5 mA
Device under test
+
−
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage , etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements ..... AC 120 V, 60 Hz
Power consumption ..... 12 W
Operating temperature ..... +5°C - +35°C (+41°F - +95°F)
Weight ..... 11.0 kg (24 lb 4 oz)
External dimensions ..... 420(W) X 399(D) X 190(H) mm 16-9/16(W) X 15-11/16(D) X 7-1/2(H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 98 dB or more (EIAJ)
Dynamic range ..... 96 dB or more (EIAJ)
Channel separation ..... 96 dB or more (EIAJ)
Harmonic distortion ..... 0.003 % or less (EIAJ)
Level difference between channels ..... 1.0 dB or less (EIAJ)
Output voltage ..... 2 ± 0.3 Vrms (EIAJ)
Wow and flutter ..... less than ±0.001% (W.PEAK) (below measurable level) (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Audio line output
Control input/output jacks
CD-DECK SYNCHRO jack
I/O INTERFACE

4. Functions

Number of discs to be stored - maximum 100.

Basic Operation Buttons
- PLAY, PAUSE, STOP

Playback mode
- All Playback Mode
- Single Playback Mode
- Custom Playback Mode

Search Function
- Disc Search
- Track Search
- Manual Search

Programming
- Maximum 32 steps
- Pause
- Program Clear (single track or all tracks)

Repeat Functions
- 1 Track Repeat
- Single Repeat
- All Discs Repeat
- Program Repeat
- Single Random Repeat
- All Discs Random Repeat
- Custom Random Repeat
- Custom Repeat

Random Play
- Random Play (repeat also available)

Switching Display
Disc/Track Number, Time Consumed (track/disc), and Total Time

ADLC
Automatic Digital Level Controller

Memory Hold
Stored Playback Mode, Program Contents, or Custom Mode

Last Disc Memory

Direct Search with the Digit buttons (remote control unit)

Power On/Off (remote control unit)

CD-DECK SYNCHRO jack

Remote Control jack

5. Display

FL Tube Display
- ► indicator
- ❚❚ indicator
- Playback Mode indicators (all, single, custom)
- Elapsed Time Display (min, sec)
- Total Time Display
- Disc Number, Track Number
- Program Step Number
- Custom Number
- Repeat indicator
- Random indicator
- Program indicator
- ADLC indicator

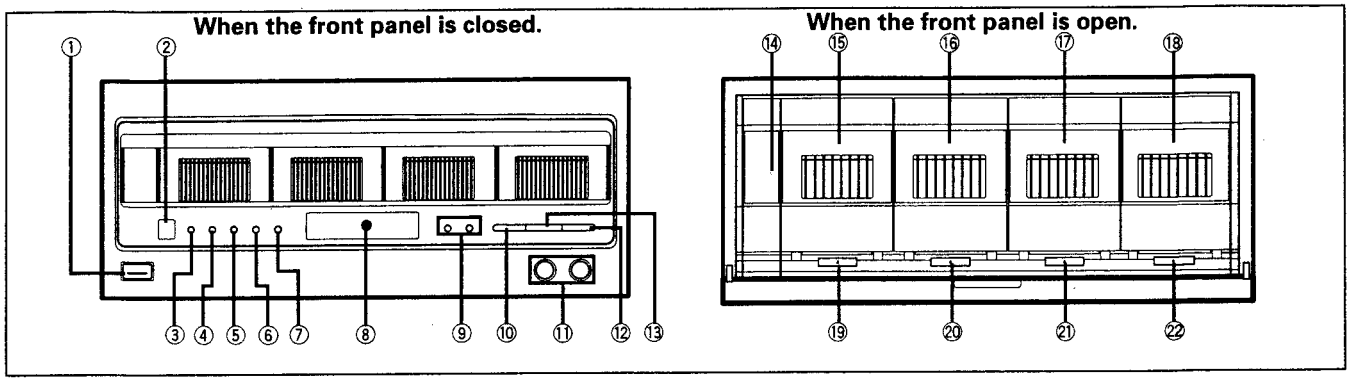
6. Accessories

- Remote control unit 1
- AAA/R03 dry cell batteries 2
- Output cable 1
- Control cable 1
- Electrostatic charge removal sheet 1
- Operating instructions 1
- Index label sheet 1
- CD liner notes file 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

3. PANEL FACILITIES

FRONT PANEL



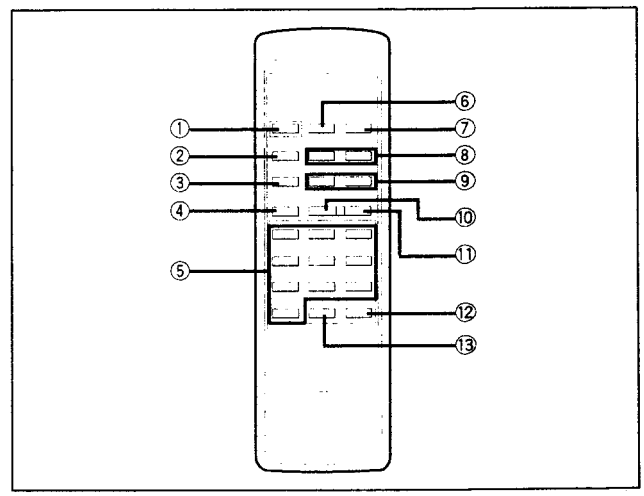
① POWER STANDBY/ON switch

② Remote sensor

Receives the signal from the remote control unit.

③ RANDOM button
④ ADLC button
⑤ TIME button
⑥ MODE button
⑦ CLEAR button
⑧ Display window
⑨ Track/Manual search buttons (⏮ ◀◀ / ▶▶ ⏭)
⑩ Stop button (■)
⑪ DISC buttons (–/+)
⑫ Play button (►)
⑬ Pause button (II)
⑭ PLAY INDICATOR
⑮ Rack 1
⑯ Rack 2
⑰ Rack 3
⑱ Rack 4
⑲ EJECT button for Rack 1 (⏏)
⑳ EJECT button for Rack 2 (⏏)
㉑ EJECT button for Rack 3 (⏏)
㉒ EJECT button for Rack 4 (⏏)

REMOTE CONTROL UNIT



Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

① POWER button
② PGM button
③ MODE button
④ Stop button (■)
⑤ Digit buttons (0 - 9)
⑥ REPEAT button
⑦ RANDOM button
⑧ DISC buttons (–/+)
⑨ Track search buttons (⏮ / ⏭)
⑩ Pause button (II)
⑪ Play button (►)
⑫ TRACK SET button
⑬ DISC SET button

4. DISASSEMBLY

4.1 REMOVAL OF LOADING MECHANISM ASSY

1. Remove the bonnet. (At this time, return the loading mechanism assy to the home position if it is not in the home position.)
2. Remove the rivet and then remove the rope unit.
3. Remove the four screws ① and then remove the select guide.
4. Remove the flat cable from the connector (CN625), and also remove the rope unit from the loading mechanism assy.
5. Raise the loading mechanism assy and remove it.

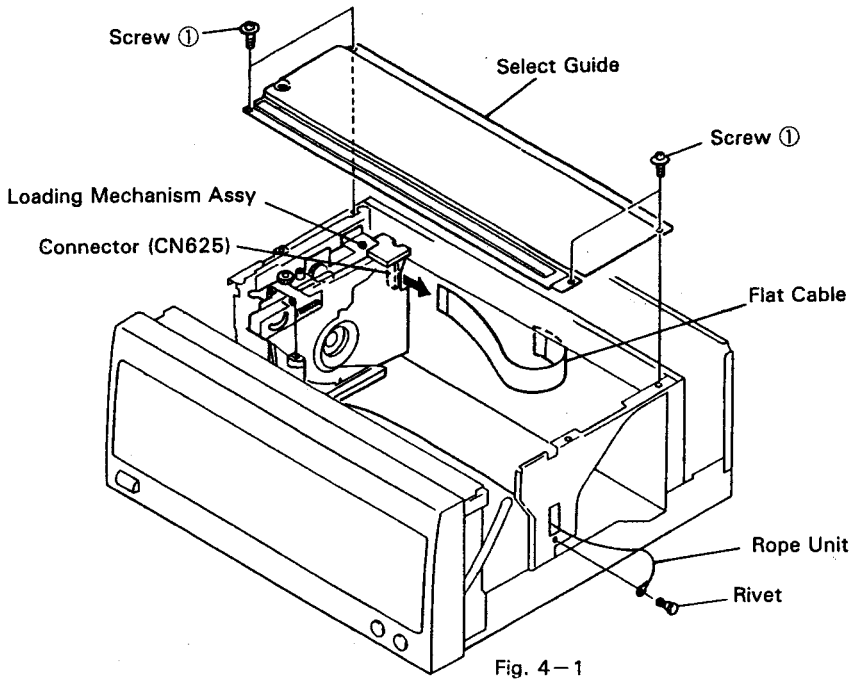


Fig. 4−1

Note) Execute assembly in reverse order of the disassembly.
However, the following items must be executed.

● Synchronization matching for upper and lower gear

Adjust the relation between the sub gear teeth and the select guide as shown in Fig. 4−2.

● Position confirmation for body and loading mechanism assy

Looking from the top, conform that part ⓐ of the gear angle B and part ⓑ of the angle L are parallel. (Refer to Fig. 4−3.)

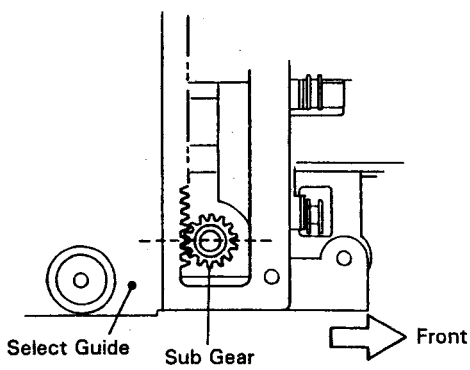


Fig. 4−2

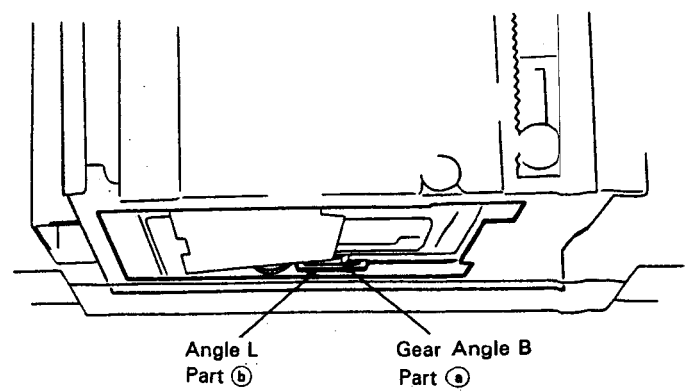


Fig. 4−3

4.2 REMOVAL OF SERVO MECHANISM ASSY

1. Remove the loading mechanism assy. [Refer to "4.1 REMOVAL OF LOADING MECHANISM ASSY".]
2. Remove the screw ① and the clamper base.
3. Remove the stopper. (At this time, remove the stopper spring at the same time.)
4. Remove the arm spring.
5. Remove the three screws ③ fixing the D cup, remove the screw ④ fixing the side angle and the connector (CN626), and then remove the D cup and the side angle.
6. Remove arm A, arm B, and the connecting rack.
7. Remove the four screws ⑤ fixing the servo mechanism assy. Remove the flexible circuit board of the pickup assy from the connector (CN621) and pull out the servo mechanism assy.
8. Remove the connector (CN610) of the servo mechanism assy and then remove the servo mechanism assy.

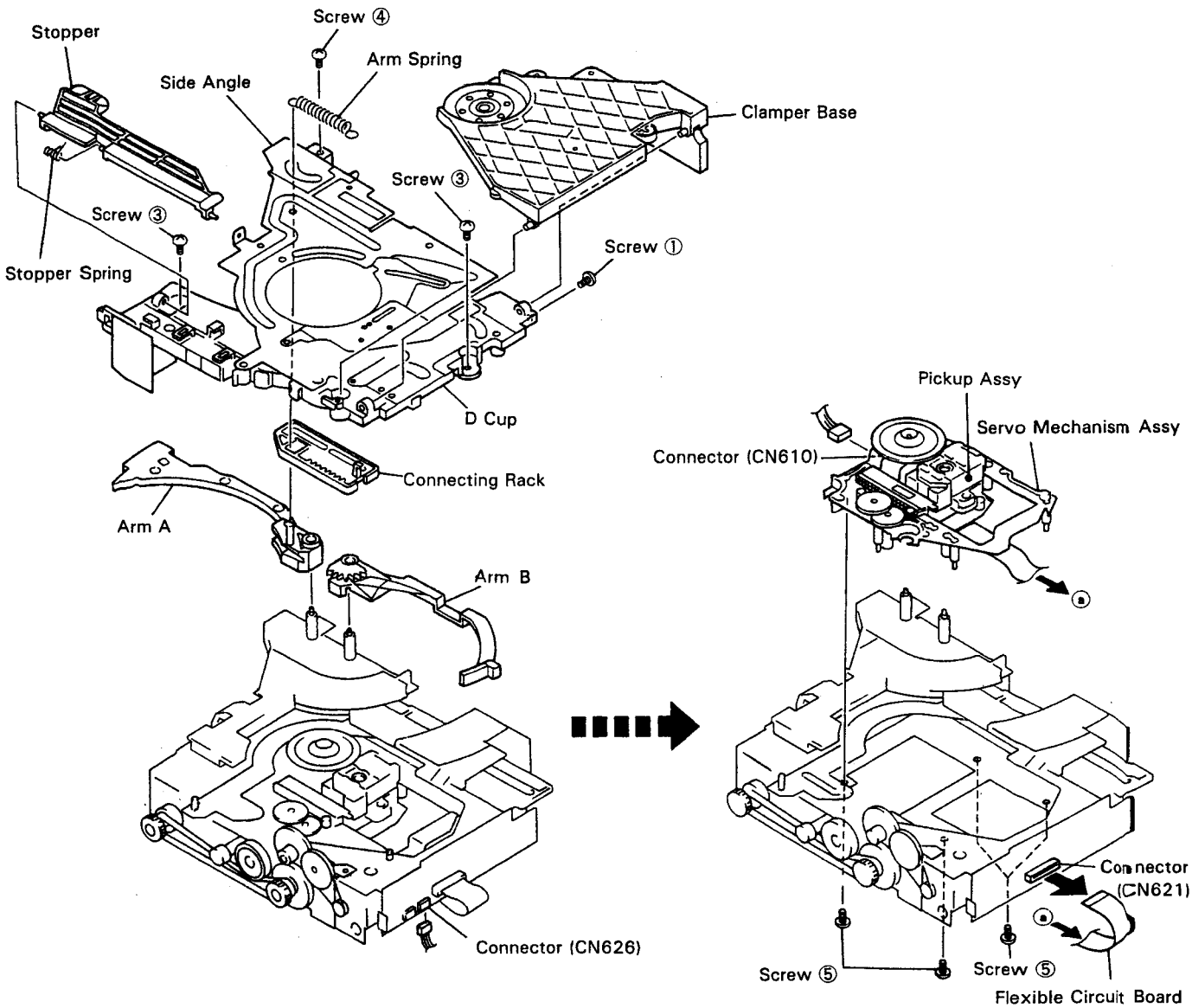


Fig. 4–4

Note) Execute assembly in reverse order of the disassembly. However, the following items must be executed.

- **Synchronization matching for arm A, arm B and connecting rack**

Confirm correct positioning of the drive plate mark and the mark of gear A as shown in Fig. 4−5. If the position is not correct, turn the worm [refer to "4.3 REMOVAL OF BELT A"] to obtain the correct position. Also, install arm A and arm B as shown in Fig. 4−6 and position the connecting rack as shown in Fig. 4−6 (refer to Ⓐ), seen from above.

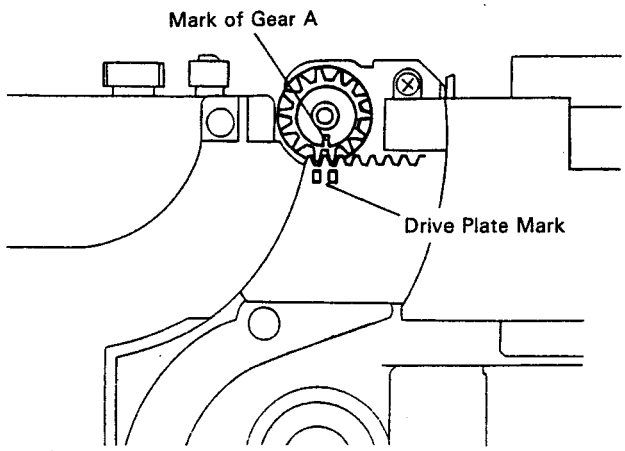


Fig. 4−5

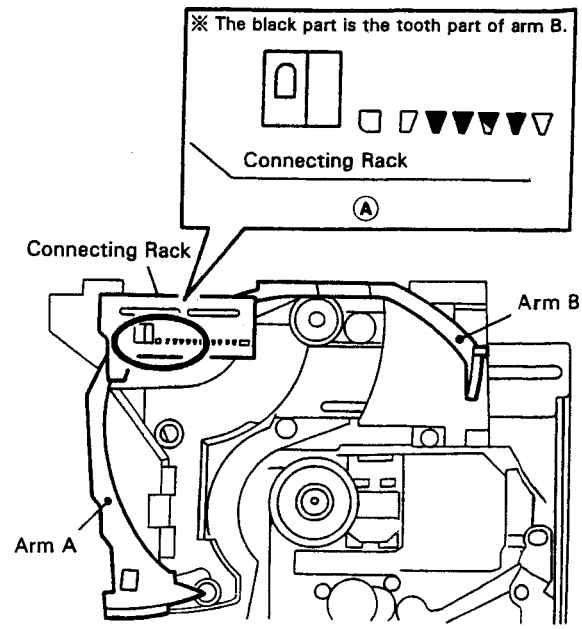


Fig. 4−6

- **Select lever position matching**

When installing the D cup, pull out the pin of the select lever and insert the lever pin into the select lever hole.

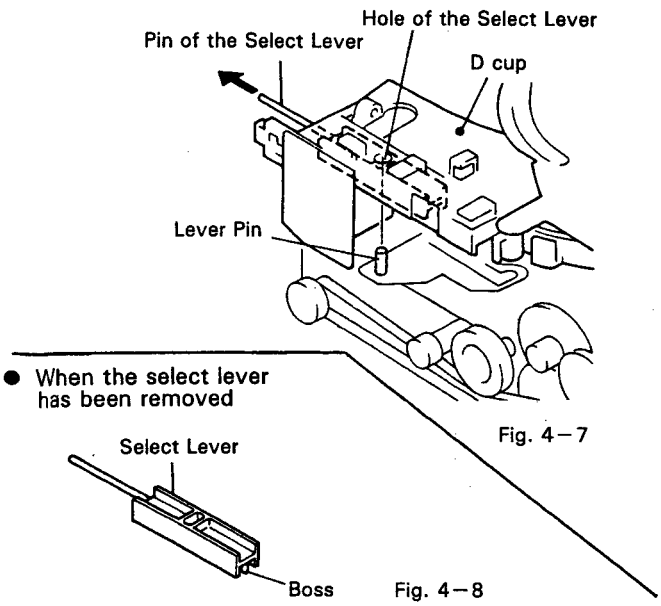


Fig. 4−7

Fig. 4−8

Note: For installation of the select lever, insert it with the boss pointing down.

- **Caution items for installation of the clamper base**

Bring part ⓒ of the clamper base onto part ⓓ of the stopper.

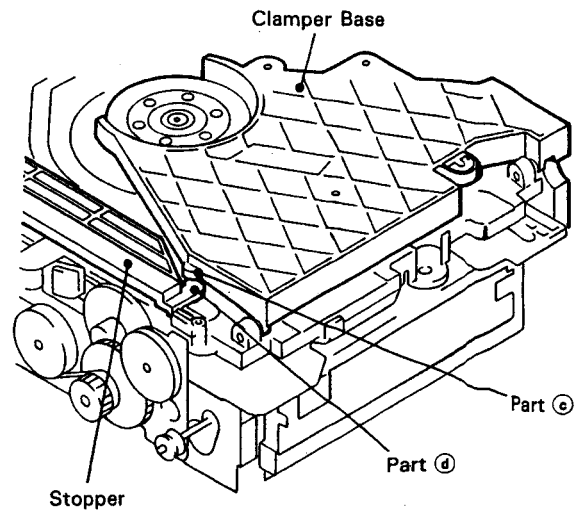


Fig. 4−9

4.3 REMOVAL OF BELT A

1. Remove the loading mechanism assy. [Refer to "4.1 REMOVAL OF LOADING MECHANISM ASSY".]
2. Pull the synchro shaft together with the sub gear. (At this time, the synchro gear, the collar, and the timing belt come off together.)
3. Remove the two screws ① fixing the gear angle A and remove the gear angle A. (At this time, the cord clamper also comes off.)
4. Remove the washer fixing the gear A and the worm wheel and remove the belt A.
   - If the work is difficult, remove the connectors (CN641, CN624) and cut the binder to make the work easier.

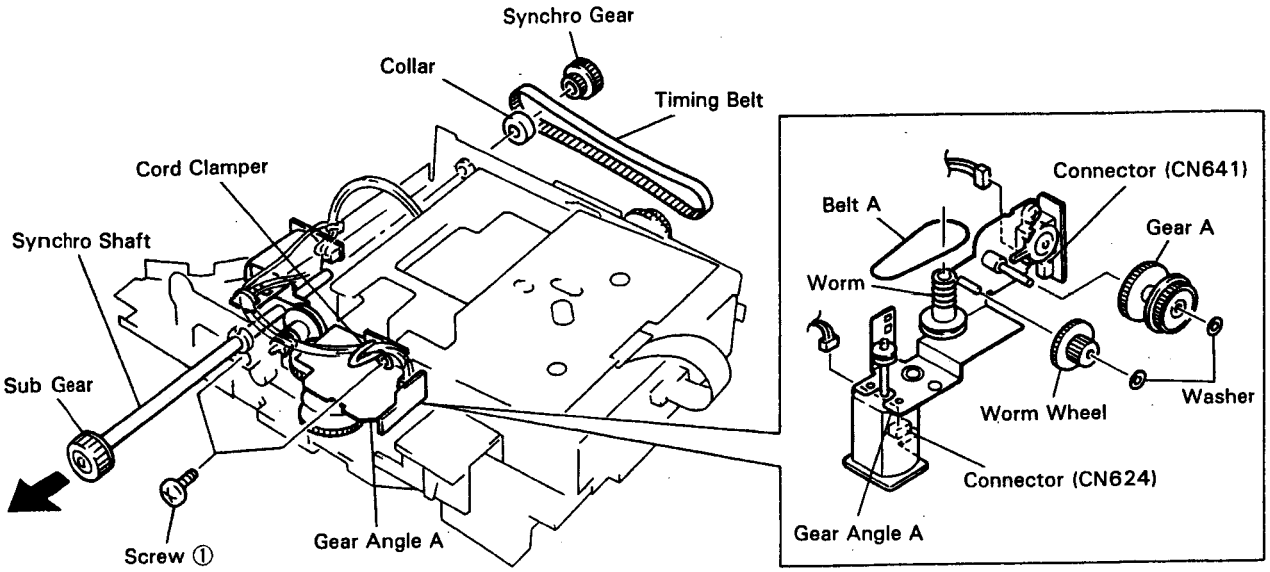


Fig. 4−10

Note) Execute assembly in reverse order of the disassembly.
However, the following items must be executed.

- **Synchronization matching for gear A and drive plate**

Match the drive plate mark and the mark of gear A as shown in Fig. 4−11, and then fix the gear angle A with the screws. (At this time, the lever of the loading switch must be on the upper side of the projection of gear A.)

- **Synchro belt installation**

Place the synchro belt as shown in Fig. 4−12 onto the synchro gear S. Place the collar onto the synchro shaft, place the timing belt onto the synchro gear, and press fit the synchro shaft in this condition.

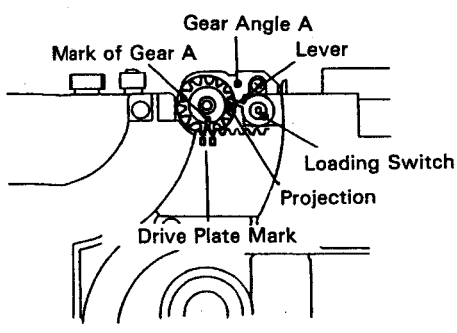


Fig. 4−11

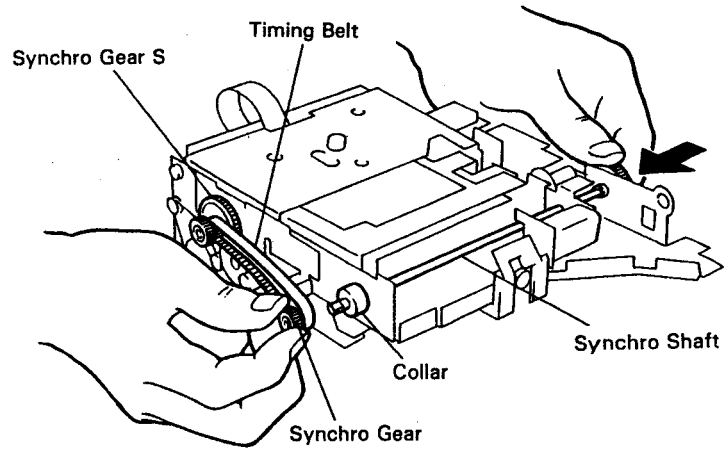


Fig. 4−12

5. EXPLODED VIEWS, PACKING AND PARTS LIST

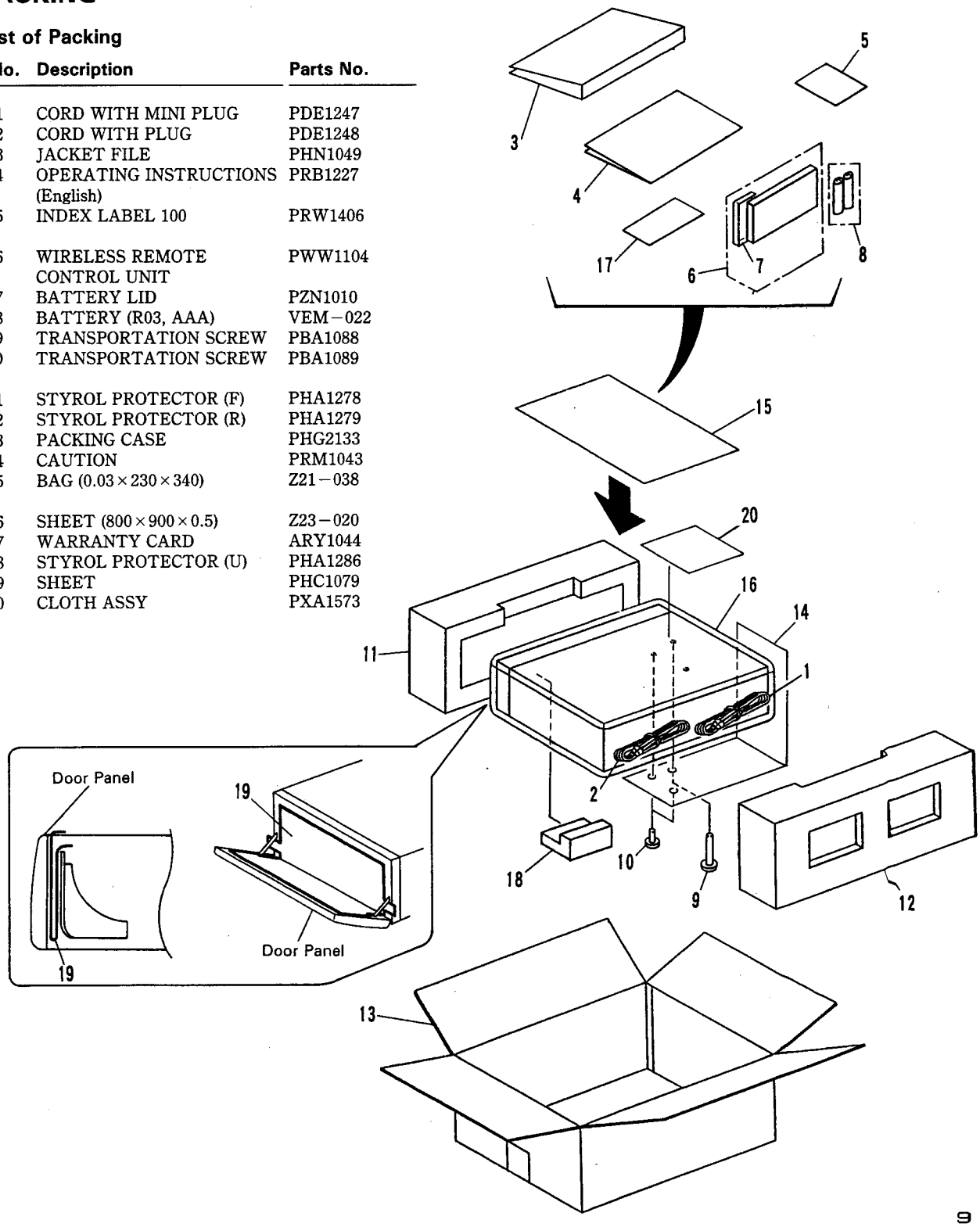
NOTES :

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

5.1 PACKING

Parts List of Packing

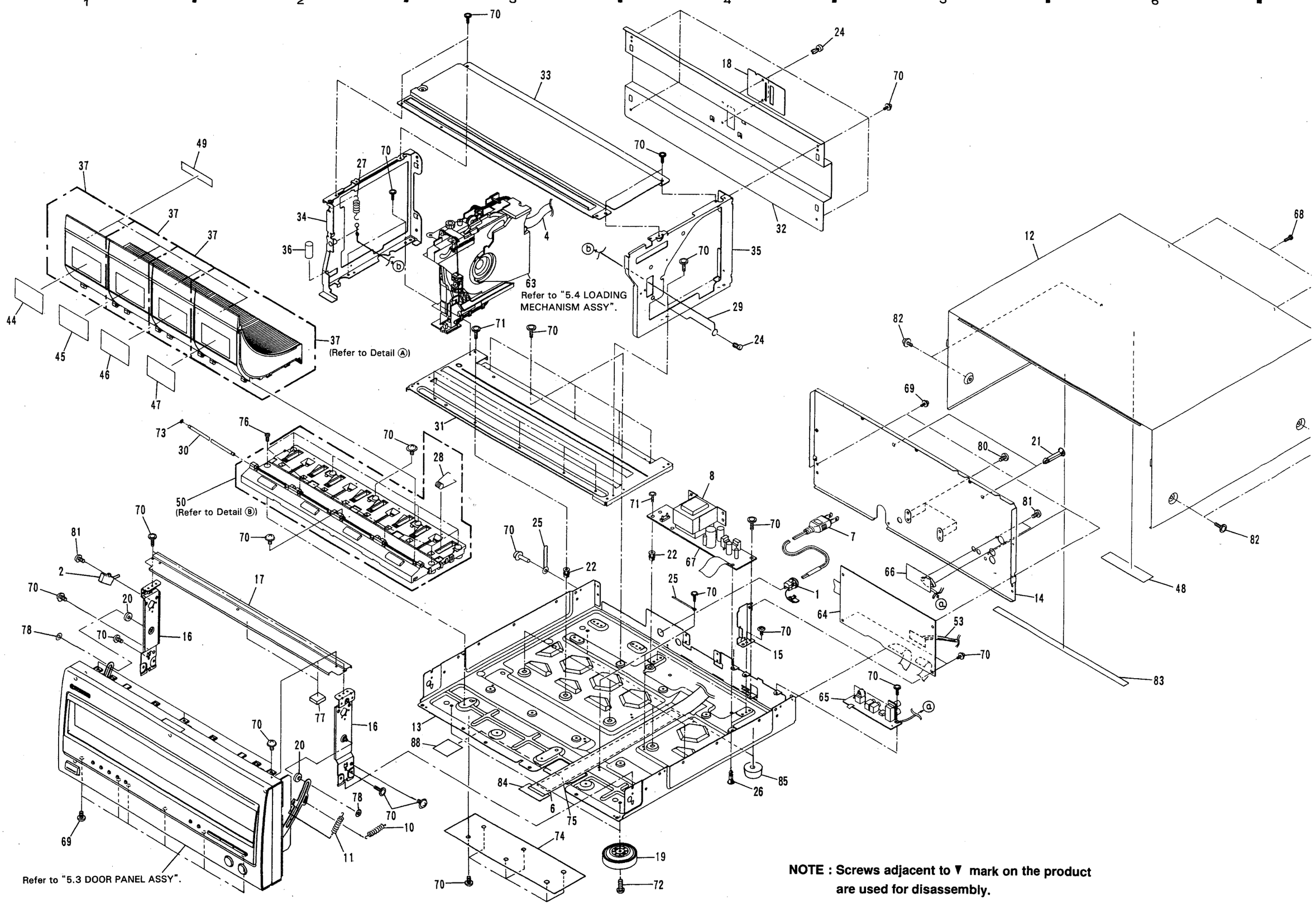
Mark	No.	Description	Parts No.
	1	CORD WITH MINI PLUG	PDE1247
	2	CORD WITH PLUG	PDE1248
	3	JACKET FILE	PHN1049
	4	OPERATING INSTRUCTIONS (English)	PRB1227
	5	INDEX LABEL 100	PRW1406
	6	WIRELESS REMOTE CONTROL UNIT	PWW1104
	7	BATTERY LID	PZN1010
NSP	8	BATTERY (R03, AAA)	VEM−022
	9	TRANSPORTATION SCREW	PBA1088
	10	TRANSPORTATION SCREW	PBA1089
	11	STYROL PROTECTOR (F)	PHA1278
	12	STYROL PROTECTOR (R)	PHA1279
	13	PACKING CASE	PHG2133
	14	CAUTION	PRM1043
	15	BAG (0.03×230×340)	Z21−038
	16	SHEET (800×900×0.5)	Z23−020
NSP	17	WARRANTY CARD	ARY1044
	18	STYROL PROTECTOR (U)	PHA1286
	19	SHEET	PHC1079
	20	CLOTH ASSY	PXA1573



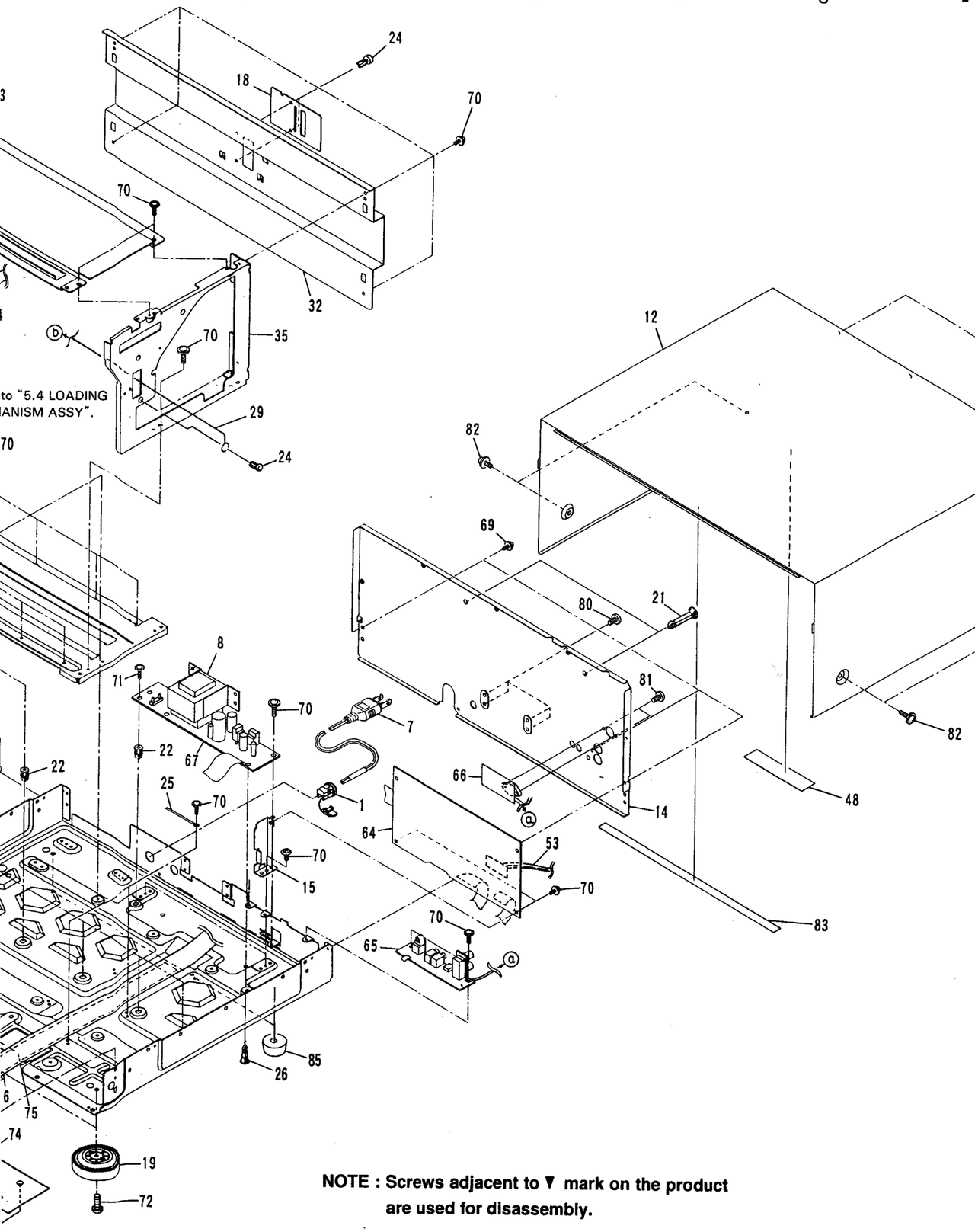
5.2 EXTERIOR

Parts List of Exterior

Mark	No.	Description	Parts No.
⚠	1	CORD STOPPER (PLASTIC)	CM−22C
	2	LEVER SWITCH (S)	DSK1003
	3	.....	
	4	22P F.F.C/30V	PDD1157
	5	.....	
	6	28P F.F.C/30V	PDD1164
⚠	7	AC POWER CORD	PDG1015
⚠	8	POWER TRANSFORMER	PTT1297
	9	.....	
	10	CANCEL SPRING	PBH1173
	11	SUPPORT SPRING	PBH1192
	12	BONNET CASE	PYY1178
NSP	13	UNDER BASE	PNA2057
	14	REAR BASE (FE)	PNA2218
	15	PCB ANGLE	PNB1468
	16	SIDE ANGLE	PNB1469
	17	ESCUTCHEON ANGLE	PNB1502
	18	FFC HOLDER	PNM1274
	19	INSULATOR	PNW1912
	20	ROLLER	PNW2468
NSP	21	SPACER 24 (PLASTIC)	PNW2484
	22	SPACER (PLASTIC)	PNY−404
	23	.....	
	24	RIVET (PLASTIC)	RBM−003
	25	CORD CLAMPER (STEEL)	RNH−184
NSP	26	SPACER	VEC1596
	27	WIRE SPRING	PBH1182
	28	EJECT SPRING	PBH1214
	29	ROPE UNIT	PBL1007
	30	SHAFT	PLA1138
	31	MAIN BASE	PNA2108
	32	REAR ANGLE	PNA2126
	33	SELECT GUIDE	PNB1479
	34	ANGLE L	PNB1516
	35	SIDE ANGLE R	PNB1517
NSP	36	SCREW HOLDER	PNW2489
	37	DISC RACK ASS'Y	PXA1574
	38	GUIDE SPRING	PBH1177
	39	GUIDE PLATE	PNB1476
NSP	40	RACK	PNW2583
NSP	41	TOP GUIDE	PNW2405
	42	RACK PANEL	PNW2406
	43	.....	
	44	RACK WINDOW 1	PAM1674
	45	RACK WINDOW 2	PAM1675
	46	RACK WINDOW 3	PAM1676
	47	RACK WINDOW 4	PAM1677
	48	65 LABEL	ORW1069
	49	ADDRESS LABEL	PRW1359
NSP	50	RACK BASE ASS'Y	PXA1572
NSP	51	RACK BOARD A ASSY	PWZ2779
NSP	52	RACK BOARD B ASSY	PWZ2781
	53	CONNECTOR ASSY 5P	PDE1266
	54	CONICAL SPRING	PBH1206
	55	LEVER SPRING	PBH1204
	56	SWITCH PLATE	PBK1131
	57	RACK BASE	PNW2407
	58	RACK LOCK	PNW2565
	59	LOCK LEVER	PNW2409
	60	SCREW	BPZ26P060FZK
	61	STOPPER SCREW	PBA1095
	62	SCREW	PPZ30P060FMC
NSP	63	LOADING MECHANISM ASSY	PXA1571
	64	MAIN BOARD ASSY	PWZ3077
NSP	65	OUTPUT BOARD ASSY	PWZ3080
NSP	66	I/O CONNECTOR BOARD ASSY	PWX1390
	67	POWER BOARD ASSY	PWZ3065
	68	SCREW	BBZ30P100FCC
	69	SCREW	BBZ30P080FCC
	70	SCREW	IBZ30P060FCC
	71	SCREW	IBZ30P150FCC
	72	SCREW	IBZ30P100FCC
	73	E RING	YE30FUC
NSP	74	BOTTOM PLATE	PNB1511
	75	FFC PLATE	PNM1275
	76	SCREW	PBA1099
	77	DISC GUARD	PNM1245
	78	WASHER	WT36D120D050
	79	.....	
	80	SCREW	IBZ30P080FCC
	81	SCREW	BBZ26P060FCC
	82	SCREW	FBT40P080FZK
	83	BONNET GUARD	PNM1244
NSP	84	JOINT BOARD ASSY	PWZ3074
	85	FOOT ASSY	AEC1531
	86	.....	
	87	.....	
	88	ISOLATION SHEET	PNM1270
NSP	89	RUBBER HOLDER	PEB1283
NSP	90	CLIK PLATE	PBK1133
	91	SCREW	Z39−024

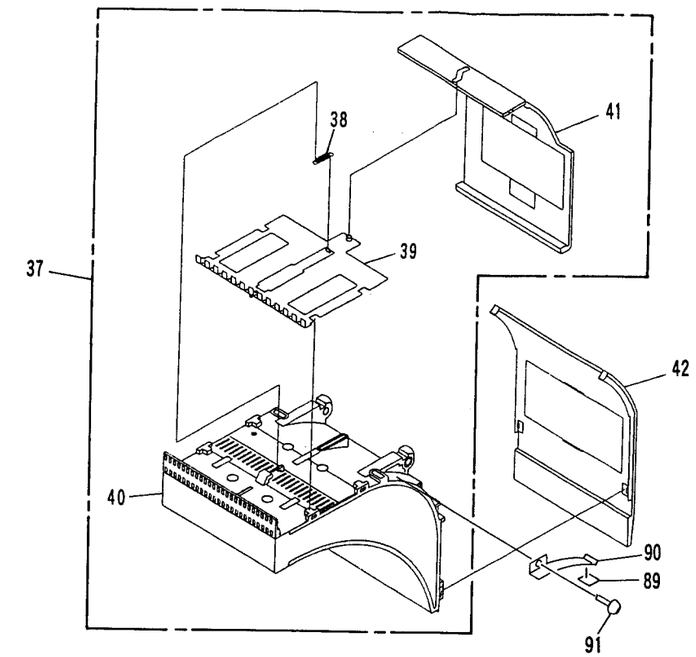


NOTE : Screws adjacent to ▼ mark on the product are used for disassembly.

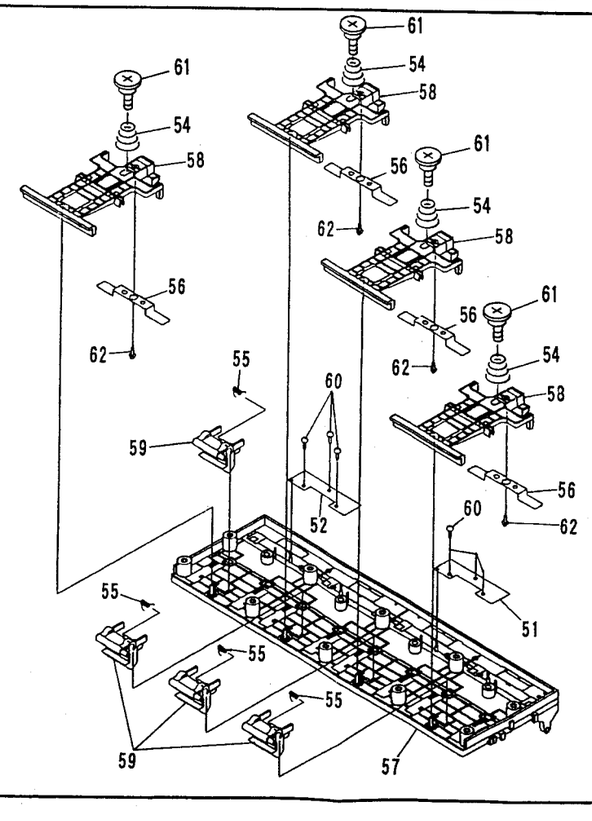


NOTE : Screws adjacent to ▼ mark on the product are used for disassembly.

● Detail Ⓐ



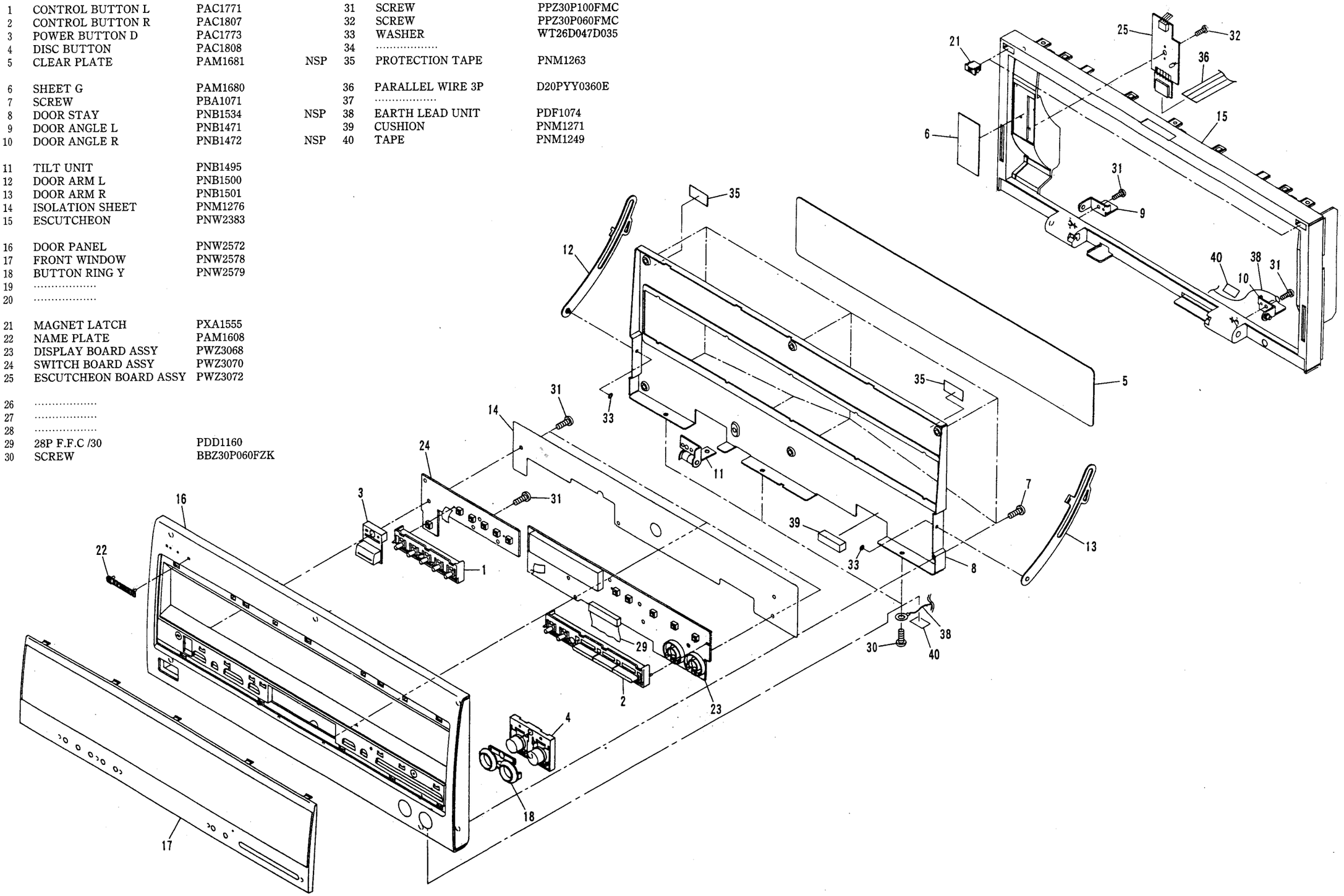
● Detail Ⓑ



5.3 DOOR PANEL ASSY

Parts List of Door Panel Assy

Mark	No.	Description	Parts No.
	1	CONTROL BUTTON L	PAC1771
	2	CONTROL BUTTON R	PAC1807
	3	POWER BUTTON D	PAC1773
	4	DISC BUTTON	PAC1808
	5	CLEAR PLATE	PAM1681
	6	SHEET G	PAM1680
	7	SCREW	PBA1071
	8	DOOR STAY	PNB1534
	9	DOOR ANGLE L	PNB1471
	10	DOOR ANGLE R	PNB1472
	11	TILT UNIT	PNB1495
	12	DOOR ARM L	PNB1500
	13	DOOR ARM R	PNB1501
	14	ISOLATION SHEET	PNM1276
	15	ESCUTCHEON	PNW2383
	16	DOOR PANEL	PNW2572
	17	FRONT WINDOW	PNW2578
	18	BUTTON RING Y	PNW2579
	19	.....	
	20	.....	
	21	MAGNET LATCH	PXA1555
	22	NAME PLATE	PAM1608
NSP	23	DISPLAY BOARD ASSY	PWZ3068
NSP	24	SWITCH BOARD ASSY	PWZ3070
NSP	25	ESCUTCHEON BOARD ASSY	PWZ3072
	26	.....	
	27	.....	
	28	.....	
	29	28P F.F.C /30	PDD1160
	30	SCREW	BBZ30P060FZK
	31	SCREW	PPZ30P100FMC
	32	SCREW	PPZ30P060FMC
	33	WASHER	WT26D047D035
	34	.....	
NSP	35	PROTECTION TAPE	PNM1263
	36	PARALLEL WIRE 3P	D20PYY0360E
	37	.....	
NSP	38	EARTH LEAD UNIT	PDF1074
	39	CUSHION	PNM1271
NSP	40	TAPE	PNM1249

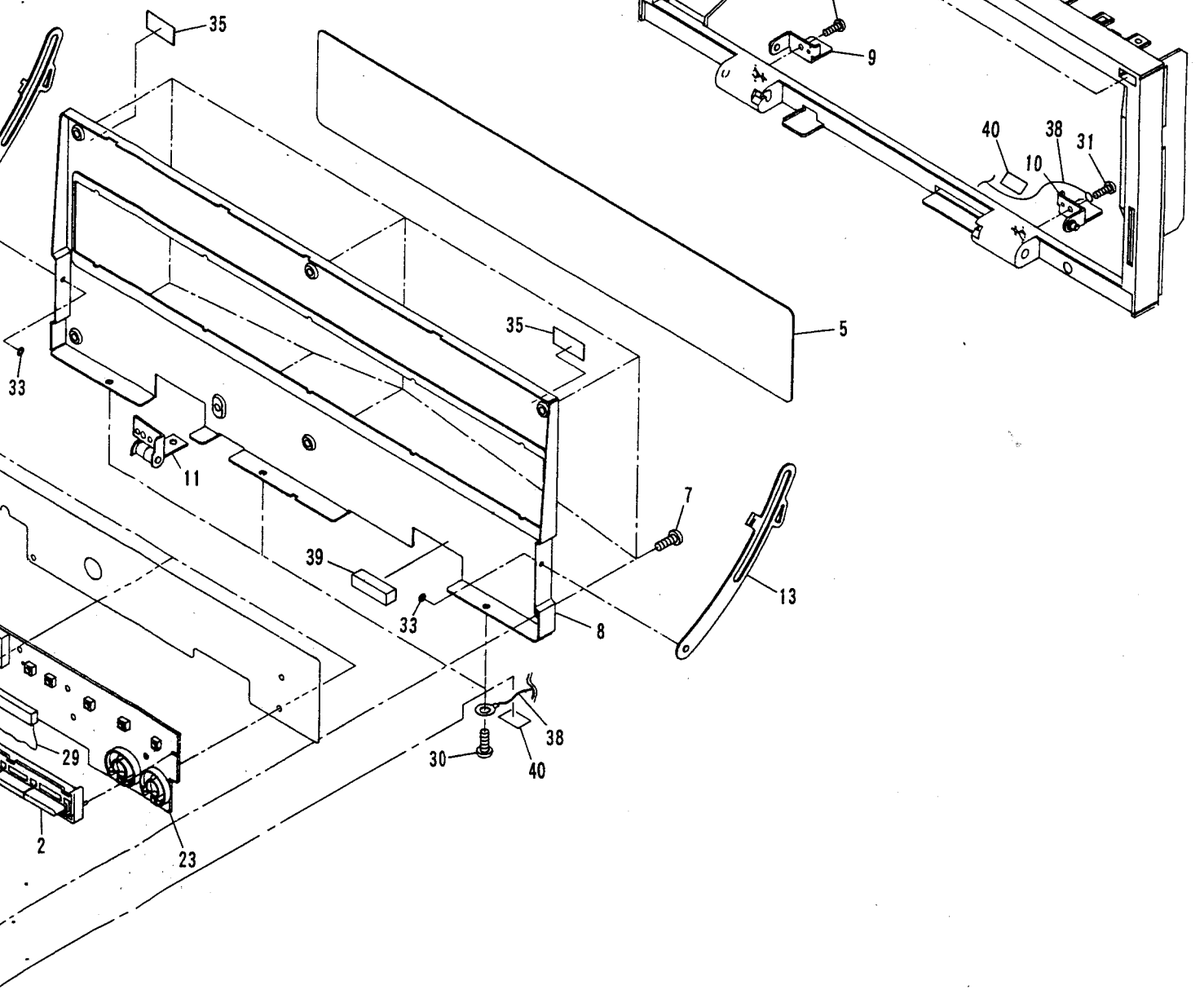


5.4 LOAD

● EXTERIO

Parts List of

Mark	No.
NSP	1
NSP	2
NSP	3
NSP	4
NSP	5
	6
	7
	8
	9
	10
	11
	12
	13
NSP	14
NSP	15
NSP	16
	17
NSP	18
NSP	19
NSP	20
	21
	22
	23
	24
	25
	26
	27
	28
	29
	30
NSP	31
	32
	33
	34
	35
NSP	36
	37
	38
	39
NSP	40
	41
	42
	43
	44
	45
	46
	47
	48
	49
	50

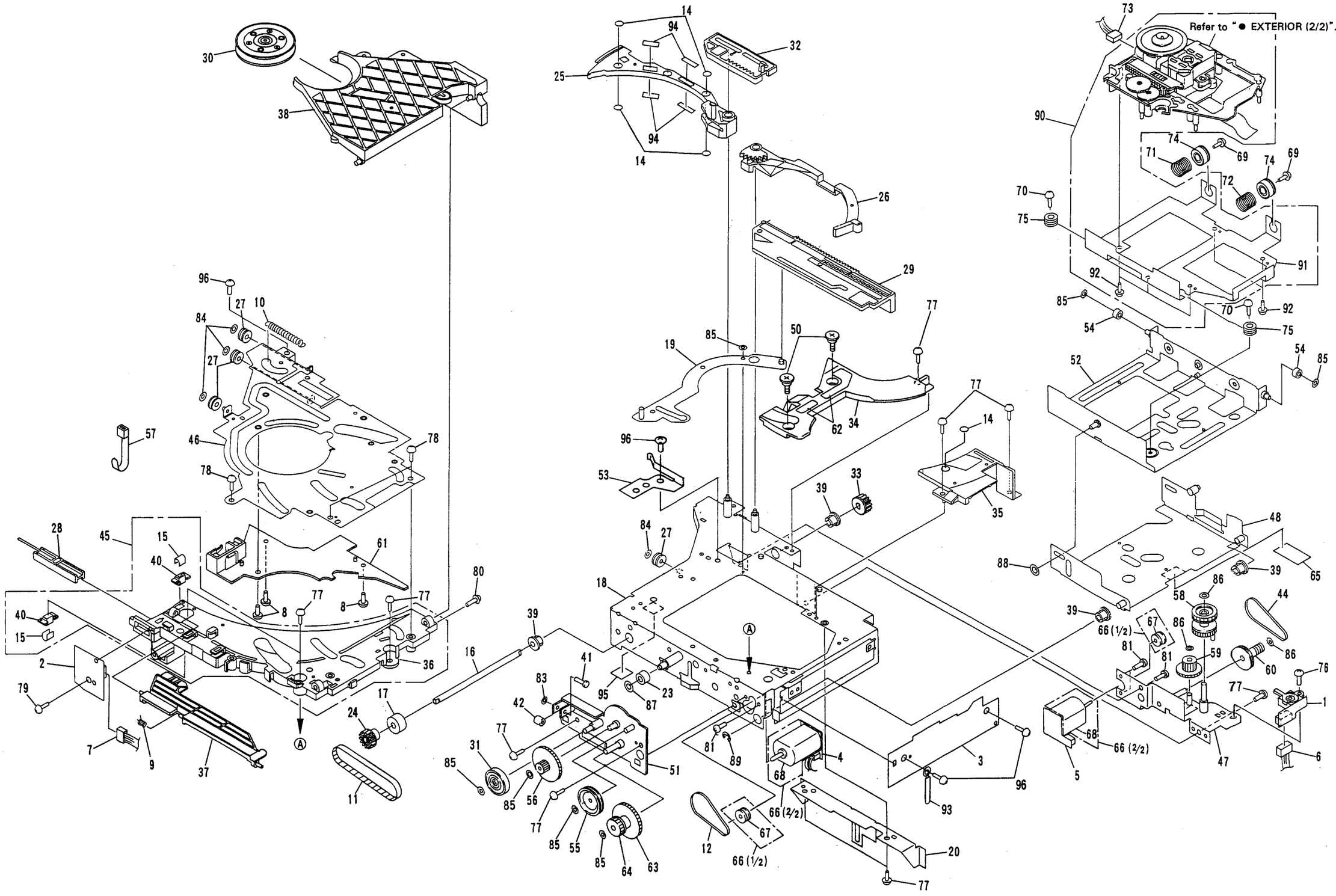


5.4 LOADING MECHANISM ASSY

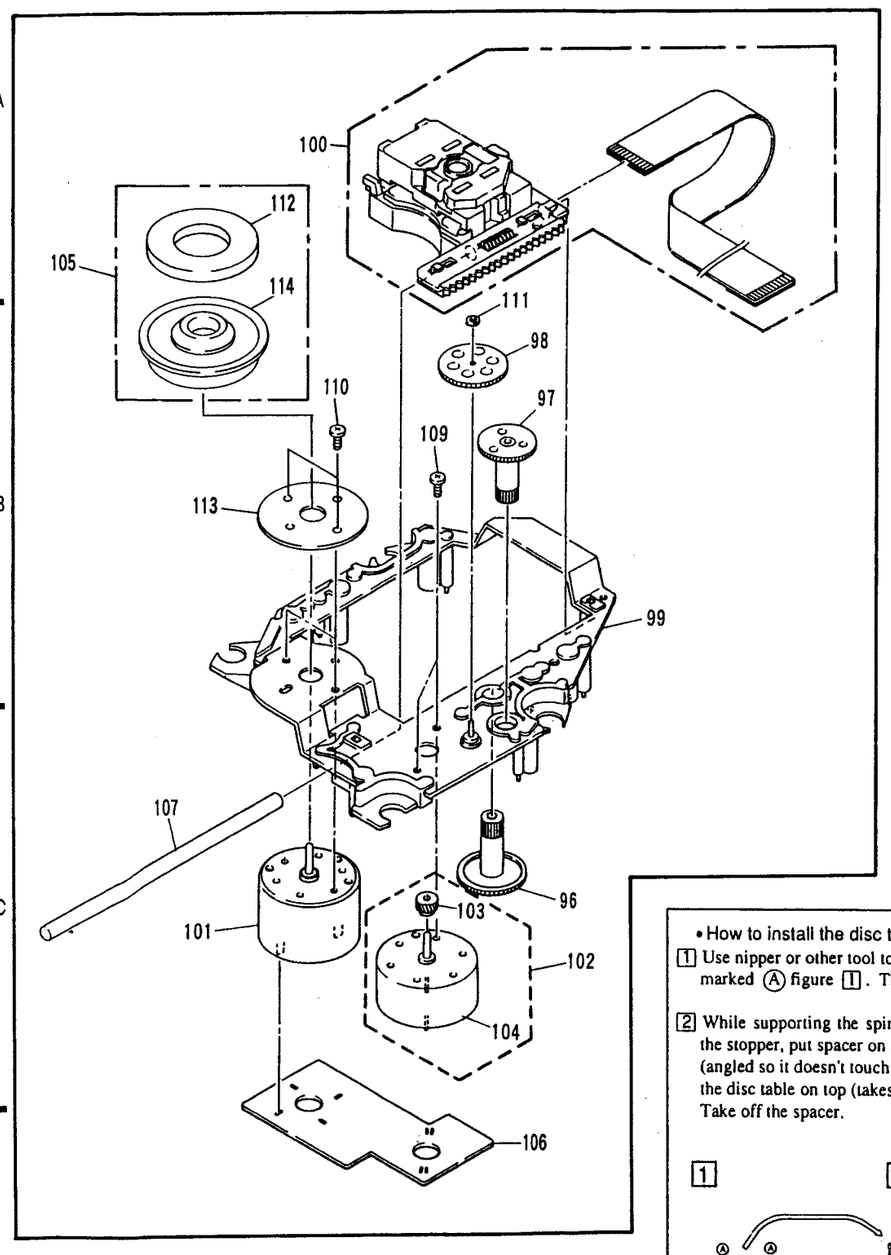
● EXTERIOR (1/2)

Parts List of Exterior (1/2)

Mark	No.	Description	Parts No.
NSP	1	MECHA BOARD ASSY	PWZ2776
NSP	2	SENSOR BOARD ASSY	PWZ2777
NSP	3	LOADING BOARD ASSY	PWZ2778
NSP	4	SELECT MOTOR BOARD ASSY	PWZ2782
NSP	5	LOADING MOTOR BOARD ASSY	PWZ2783
	6	CONNECTOR ASSY (3P)	PDE1234
	7	CONNECTOR ASSY (4P)	PDE1235
	8	SCREW	PBA1090
	9	STOPPER SPRING	PBH1183
	10	ARM SPRING	PBH1202
	11	BELT	PEB1268
	12	BELT	PEB1269
	13	.....	
	14	CUSHION (ART. SUEDE)	PED−049
NSP	15	CUSHION (ART. SUEDE)	PED1016
NSP	16	SYNCHRO SHAFT	PLA1131
	17	SPACER	PLA1133
NSP	18	LOADING BASE	PNB1532
NSP	19	LEVER	PNB1486
NSP	20	SLIDE ANGLE	PNB1489
	21	.....	
	22	.....	
	23	ROLLER	PNW2299
	24	SYNCHRO GEAR	PNW2413
	25	ARM A	PNW2554
	26	ARM B	PNW2541
	27	PULLEY	PNW2416
	28	SELECT LEVER	PNW2417
	29	DRIVE PLATE	PNW2549
	30	CLAMPER	PNW2569
NSP	31	TENSIONER	PNW2423
	32	RACK	PNW2555
	33	SUB GEAR	PNW2425
	34	A CUP	PNW2553
	35	B CUP	PNW2427
NSP	36	D CUP	PNW2429
	37	STOPPER	PNW2556
	38	CLAMPER BASE	PNW2576
	39	BUSHING	PNW2435
NSP	40	DISC GUIDE	PNW2550
	41	ROLLER SHAFT	PLA1139
	42	ROLLER	DNK2391
	43	.....	
	44	BELT A	PEB1244
	45	D CUP ASSY	PEA1329
	46	SIDE ANGLE	PNB1533
	47	GEAR ANGLE	PNB1485
	48	SLIDE LINK	PNB1490
	49	.....	
	50	SCREW	PBA1099
	51	GEAR ANGLE B	PNB1496
	52	SLIDER	PNB1531
	53	UPPER PLATE	PBK1141
	54	ROLLER	PNW1967
	55	GEAR PULLEY	PNW2411
	56	GEAR L	PNW2412
	57	BINDER	Z09−056
	58	GEAR A	PNW2420
	59	WORM WHEEL	PNW2421
	60	WORM	PNW2422
	61	C CUP	PNW2537
	62	SHEET	PED1026
	63	GEAR S	PNW2433
	64	SYNCHRO GEAR S	PNW2434
	65	FLEXIBLE GUARD	PNM1264
	66	MOTOR ASSY	PEA1320
	67	MOTOR PULLEY	PNW1634
NSP	68	MOTOR	PXM1002
	69	SCREW	PBA1084
	70	SCREW	PBA1087
	71	FLOAT SPRING	PBH1197
	72	FLOAT SPRING B	PBH1198
	73	CONNECTOR ASS'Y (4P)	PDE1240
	74	FLOAT RUBBER	PEB1267
	75	RUBBER BUSHING	VEB1138
	76	SCREW	BBZ26P060FZK
	77	SCREW	BBZ30P050FZK
	78	SCREW	BBZ30P080FCC
	79	SCREW	BPZ30P060FZK
	80	.....	
	81	SCREW	PMZ20P030FMC
	82	.....	
	83	WASHER	WT17D034D025
	84	WASHER	WT21D050D025
	85	WASHER	WT26D047D025
	86	WASHER	WT26D047D050
	87	WASHER	WT36D072D025
	88	E RING	YE25FUC
	89	E RING	YE30FUC
NSP	90	SERVO MECHANISM ASS'Y B	PXA1539
NSP	91	SERVO BASE	PNB1477
	92	SCREW	BPZ26P100FMC
	93	BINDER	RNH−184
	94	SHEET (S)	PED1022
	95	DG SPACER	PNM1261
	96	SCREW	BCZ30P050FMC


Refer to "● EXTERIOR (2/2)".
A
B
C
D
1
2
3
4
5
6

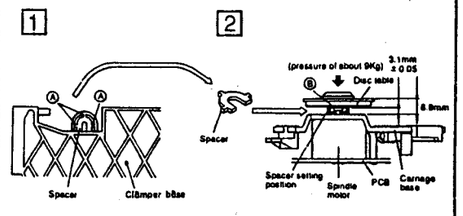
● EXTERIOR (2/2) (Servo Mechanism Assy B)



• How to install the disc table

[1] Use nipper or other tool to cut the three sections marked (A) figure [1]. Then remove the spacer.

[2] While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section (B)),and stick the disc table on top (takes about 9Kg pressure). Take off the spacer.



Parts List of Exterior (2/2)

Mark	No.	Description	Parts No.
	96	GEAR 1 (POM)	PNW2052
	97	GEAR 2 (POM)	PNW2053
	98	GEAR 3 (POM)	PNW2054
	99	CARRIDGE BASE (FE)	PNW2445
	100	PICK UP ASS'Y	PEA1319
	101	D.C. MOTOR ASSY (SPINDLE)	PEA1235
	102	D.C. MOTOR ASSY (CARRIAGE)	PEA1246
	103	PINION GEAR (POM)	PNW2055
NSP	104	DC MOTOR	PXM1027
	105	DISC TABLE ASS'Y	PEA1314
NSP	106	MECHANISM BOARD ASSY	PWX1192
	107	GUIDE BAR (STEEL)	PLA1094
	108	.....	
	109	SCREW	JFZ17P025FZK
	110	SCREW	JFZ20P040FMC
	111	WASHER	WT12D032D025
	112	CLAMP MAGNET	PMF1014
NSP	113	YOKE M	PNB1312
NSP	114	DISC TABLE	PNW2410

6. PCB PARTS LIST

NOTES :

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56 × 10¹ → 561 ..... RD1/8PM [5][6][1] J
47kΩ → 47 × 10³ → 473 ..... RD1/4PS [4][7][3] J
0.5Ω → 0R5 ..... RN2H [0][R][5] K
1Ω → 010 ..... RS1P [0][1][0] K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562 × 10¹ → 5621 ..... RM1/4PC [5][6][2][1] F

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
⚠		MOTHER BOARD ASSY	PWM1975
		├─MAIN BOARD ASSY	PWZ3077
NSP		└─OUTPUT BOARD ASSY	PWZ3080
NSP		I/O CONNECTOR BOARD ASSY	PWX1390
NSP⚠		SUB BOARD ASSY	PWX1419
		├─POWER BOARD ASSY	PWZ3065
NSP		├─DISPLAY BOARD ASSY	PWZ3068
NSP		├─SWITCH BOARD ASSY	PWZ3070
NSP		├─ESCUTCHEON BOARD ASSY	PWZ3072
NSP		└─JOINT BOARD ASSY	PWZ3074
NSP		RACK BASE ASSY	PXA1572
NSP		└─RACK BOARD ASSY	PWX1340
NSP		├─ RACK BOARD A ASSY	PWZ2779
NSP		└─ RACK BOARD B ASSY	PWZ2781
NSP		LOADING MECHANISM ASSY	PXA1571
NSP		├─LOADING MECHANISM BOARD ASSY	PWX1422
NSP		│ ├─ MECHA BOARD ASSY	PWZ2776
NSP		│ ├─ SENSOR BOARD ASSY	PWZ2777
NSP		│ ├─ LOADING BOARD ASSY	PWZ2778
NSP		│ ├─ SELECT MOTOR BOARD ASSY	PWZ2782
NSP		│ └─ LOADING MOTOR BOARD ASSY	PWZ2783
NSP		└─SERVO MECHANISM ASSY B	PXA1539
NSP		└─ MECHANISM BOARD ASSY	PWX1192

MAIN BOARD ASSY

SEMICONDUCTORS

	IC151	SERVO IC	CXA1372Q
⚠	IC201, 202	POWER OP−AMP IC	LA6520
⚠	IC203	POWER OP−AMP IC	LA6517
	IC301	EFM DEMODULATION IC	CXD2500BQ
	IC351	MICROCOMPUTER, IC	PD3315A
	IC401	D/A CONVERTER IC	PD2026B(L)
	IC405	IC	NJM4558M
	Q322	DIGITAL TRANSISTOR	DTC124EK
	Q391	CHIP TRANSISTOR	2SC2412K
	Q403, 404	TRANSISTOR	2SD2114K
	Q405	DIGITAL TRANSISTOR	DTC124EK
	D391−397	DIODE	1SS133X

SWITCHES AND RELAYS

S301	SWITCH	PSG1006

COILS AND FILTERS

L351	RADIAL INDUCTOR	LFA820K

CAPACITORS

C152, 153	ELECT. CAPACITOR	CEAS101M10
C155	CERAMIC CAPACITOR	CKSQYB182K50
C156	CERAMIC CAPACITOR	CKSQYB333K25
C157	CERAMIC CAPACITOR	CKSQYB103K50
C158, 159	CERAMIC CAPACITOR	CKSQYB104K25
C160	ELECT. CAPACITOR	CEAS4R7M50
C161	CERAMIC CAPACITOR	CKSQYB104K25
C162	ELECT. CAPACITOR	CEAS4R7M50
C163	CERAMIC CAPACITOR	CKSQYB104K25
C164, 167	CERAMIC CAPACITOR	CKSQYB103K50
C168	CERAMIC CAPACITOR	CKSQYB333K25
C169	CERAMIC CAPACITOR	CKSQYB103K50
C170	CERAMIC CAPACITOR	CKSQYB332K50
C171, 172	CERAMIC CAPACITOR	CKSQYB472K50
C205	CERAMIC CAPACITOR	CKSQYB103K50
C208, 209	ELECT. CAPACITOR	CEAS330M16
C210, 215	CERAMIC CAPACITOR	CKSQYB103K50
C218, 219	CERAMIC CAPACITOR	CKSQYB103K50
C225, 230	CERAMIC CAPACITOR	CKSQYB103K50
C301, 302	ELECT. CAPACITOR	CEAS330M16
C303	CERAMIC CAPACITOR	CKSQYB104K25
C304, 305	CERAMIC CAPACITOR	CKSQYF104Z25
C306	CERAMIC CAPACITOR	CKSQYB152K50
C307	CERAMIC CAPACITOR	CKSQYB473K25
C308	CERAMIC CAPACITOR	CKSQYB103K50
C309	ELECT. CAPACITOR	CEAS4R47M50
C351	ELECT. CAPACITOR	CEAS331M6R3
C352, 353	CHIP CAPACITOR	CKSQYF103Z50
C354	CHIP CAPACITOR	CCSQCH101J50
C355, 361	CHIP CAPACITOR	CKSQYF103Z50
C367	CHIP CAPACITOR	CKSQYF103Z50
C393	CHIP CAPACITOR	CCSQCH101J50
C401	ELECT. CAPACITOR	CEAS330M16
C403	CHIP CAPACITOR	CCSQCH120J50
C404	CHIP CERAMIC C.	CCSQCH220J50

Mark	No.	Description	Parts No.
	C406, 410	CERAMIC CAPACITOR	CKSQYF104Z25
	C413	AUDIO FILM CAPACITOR	CFTYA104J50
	C414	CERAMIC CAPACITOR	CKSQYF104Z25
	C415, 416	AUDIO FILM CAPACITOR	CFTYA104J50
	C421	AUDIO FILM CAPACITOR	CFTYA104J50
	C423, 424	CERAMIC CAPACITOR	CKSQYF104Z25
	C429, 430	CHIP CAPACITOR	CCSQCH390J50
	C431, 432	ELECT. CAPACITOR	CEAS330M16
	C433, 434	ELECT. CAPACITOR	CEAS220M25
	C435−438	CHIP CAPACITOR	CCSQCH050C50
	C461	CHIP CAPACITOR	CKSQYF103Z50
	C71−74	ELECT. CAPACITOR	CEAS330M16
	C75−79	CERAMIC CAPACITOR	CKSQYF104Z25
RESISTORS			
	VR151, 152	VR(22k)	RCP1084
	R439−442	CHIP METAL OXIDE RESISTOR	RN1/10SE104D
		OTHER RESISTORS	RS1/10S□□□J
OTHERS			
	CN11	12PJUMPER CONNECTOR	52147−1210
	CN201	JACK 6P	VKN−004
	CN202	22P CONNECTOR	52044−2245
	CN203	CONNECTOR 5P	173981−5
	CN351	CONNECTOR 28P	9604S−28C
	CN352	3P JUMPER CONNECTOR	52147−0310
	CN353	9P JUMPER CONNECTOR	52147−0910
	X351	CERAMIC RESONATOR	VSS1031
	X401	XTAL RES (OSC)	PSS1008

OUTPUT BOARD ASSY

COILS AND FILTERS			
	L391	RADIAL INDUCTOR	LFA010K
	L395, 396	RADIAL INDUCTOR	LFA010K
CAPACITORS			
	C388, 389	CERAMIC CAPACITOR	CKSQYB104K25
	C397	CERAMIC CAPACITOR	CCCCH470J50
	C398	CERAMIC CAPACITOR	CGCYX104K25
	C399	CERAMIC CAPACITOR	CCCCH470J50
	C441, 442	AUDIO FILM CAPACITOR	CFTXA152J50
OTHERS			
	JA391, 392	JACK	RKN1004
	JA393	JACK	PKN1005
	JA401	JACK	PKB1009

I/O CONNECTOR BOARD ASSY

SEMICONDUCTORS			
	D1301−1314	DIODE	1SS254
CAPACITORS			
	C1301−1305	AXIAL CAPACITOR	CKPUYB101K50
	C1306−1308	CERAMIC CAPACITOR	CKPUYF103Z25
RESISTORS			
		ALL RESISTORS	RD1/6PM□□□J
OTHERS			
	JA394	CONNECTOR	PKP−038

Mark	No.	Description	Parts No.
POWER BOARD ASSY			
SEMICONDUCTORS			
⚠	IC21	REGULATOR, IC	PQ05RR12
⚠	IC22	REGULATOR IC	NJM79L05A
⚠	D11−14	DIODE	11ES2
⚠	D52	DIODE	11ES2
	D54	ZENNER DIODE	MTZJ18B/C
CAPACITORS			
	C11, 13	CERAMIC CAPACITOR	CKCYF103Z50
	C15−17	CERAMIC CAPACITOR	CKCYF103Z50
	C25	ELECT. CAPACITOR	CEAS472M16
	C26	ELECT. CAPACITOR	CEAS102M16
	C27	ELECT. CAPACITOR	CEAS471M6R3
	C28	ELECT. CAPACITOR	CEAS101M10
	C52	ELECT. CAPACITOR	CEAS101M35
RESISTORS			
	R22	CARBON FILM RESISTOR	RD1/6PM103J
	R51	CARBON FILM RESISTOR	RD1/6PM103J
	R52−54	CARBON FILM RESISTOR	RD1/6PM152J
TRANSFORMER			
⚠		POWER TRANSFOMER	PTT1297
OTHERS			
⚠		TERMINAL	RKC−061

DISPLAY BOARD ASSY

SEMICONDUCTORS			
	D703, 704	DIODE	1SS254
SWITCHES AND RELAYS			
	S703, 707	SWITCH	PSG1006
	S708, 711	SWITCH	PSG1006
	S712, 715	SWITCH	PSG1006
	S716	SWITCH	PSG1006
RESISTORS			
	R701−704	CARBON FILM RESISTOR	RD1/6PM103J
OTHERS			
	CN701	CONNECTOR 28P	9604S−28F
	V701	FL TUBE	PEL1079

SWITCH BOARD ASSY

SEMICONDUCTORS			
	D701, 702	DIODE	1SS254
SWITCHES AND RELAYS			
	S701, 702	SWITCH	PSG1006
	S709, 710	SWITCH	PSG1006
	S713, 714	SWITCH	PSG1006
OTHERS			
		REMOTE SENSOR	SBX1785

Mark	No.	Description	Parts No.
ESCUTCHEON BOARD ASSY			
SEMICONDUCTORS			
	D801	LED	SEL6210S-TS
RESISTORS			
	R801	CARBON FILM RESISTOR	RD1/6PM331J
OTHERS			
	CN801	3PJUMPER CONNECTOR	52151-0310
	J802	CONNECTOR ASS'Y	PDE1250
JOINT BOARD ASSY			
OTHERS			
	CN751, 752	CONNECTOR 28P	9604S-28F
RACK BOARD A ASSY			
SWITCHES AND RELAYS			
	S651, 652	PUSH SWITCH	DSG1015
OTHERS			
	CN651	CONNECTOR 5P	VKN1062
RACK BOARD B ASSY			
SWITCHES AND RELAYS			
	S653, 654	PUSH SWITCH	DSG1015
MECHA BOARD ASSY			
OTHERS			
	CN621	CONNECTOR	12FMZ-ABT
	CN622	CONNECTOR 3P	4-173979-3
	CN623	CONNECTOR 4P	173979-4
	CN624	CONNECTOR 3P	6-173979-3
	CN625	CONNECTOR 22P	SLEM22R-2
	CN626	CONNECTOR 3P	6-173979-4
	CN627	CONNECTOR 3P	173979-3
SENSOR BOARD ASSY			
SEMICONDUCTORS			
	Q631	PHOTO-INTERRUPTER	GP1A53HR
SWITCHES AND RELAYS			
	S631	PUSH SWITCH	DSG1016
RESISTORS			
	R631	CARBON FILM RESISTOR	RD1/6PM471J
OTHERS			
	CN631	CONNECTOR 3P	6-173979-4

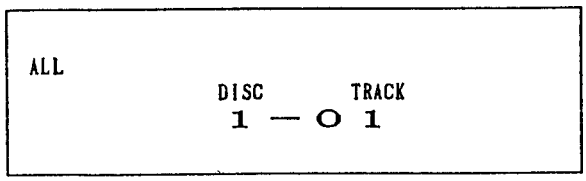
Mark	No.	Description	Parts No.
LOADING BOARD ASSY			
SWITCHES AND RELAYS			
		REAF SWITCH	VSK1011
OTHERS			
	CN641	CONNECTOR 3P	4-173979-3
SELECT MOTOR BOARD ASSY			
OTHERS			
	J627	CONNECTOR ASS'Y 2P	PDE1244
LOADING MOTOR BOARD ASSY			
OTHERS			
	J624	CONNECTOR ASS'Y 2P	PDE1245
MECHANISM BOARD ASSY			
SWITCHES AND RELAYS			
	S610	PUSH SWITCH	DSG1016
OTHERS			
	CN610	CONNECTOR 4P	173979-4

7. OPERATING DESCRIPTION

7.1 POWER SUPPLY RECEPTACLE ON

When the mechanism is not at the home position when the power supply receptacle is switched ON, it will return to the home position, the mechanism will be clamped and stop will be executed with the following display.
The normal play mode will be <ALL> mode when no mode specification has been made.

Receptacle ON (DISC Display)

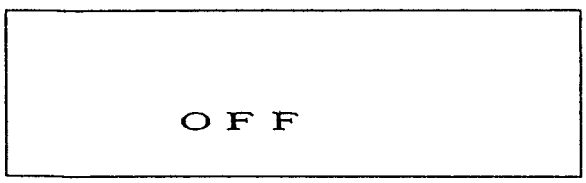


7.2 POWER ON/OFF (Product, Remote Control)

1. POWER—OFF

1. When the <POWER ON/OFF> key is pressed at the time of POWER ON, the entire FL will go out, and power OFF condition will be reached.
2. Except for the <POWER ON/OFF> key, all other keys are disabled during POWER OFF.
3. When the <POWER ON/OFF> key is pressed during PLAY, during SEARCH, etc., the operation will be stopped, the disc will be stored, the mechanism will return to the home position, clamping will be executed, and then the power will be switched OFF.
   At this time, "OFF" is displayed at the 7-segment display to indicate that POWER—OFF is being executed.

During POWER—OFF



4. The play mode, the program, the customer, and the last disc are kept even when POWER OFF is executed.

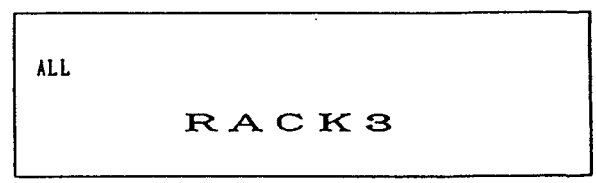
2. POWER—ON

1. When the <POWER ON/OFF> key is pressed at the time of POWER OFF, the FL will light, and all keys will be enabled.
2. The disc No. at the time of POWER OFF will be displayed, and when then the <PLAY> key is pressed, that disc will be searched and played. (Last Disc Memory specifications)
3. When the <TRACK—BACK> key is pressed within 1 sec. after POWER—ON, the business demonstration display will be started. When a key is pressed or the door is opened, the demonstration will stop, and the display returns to the original display mode.

7.3 DOOR AND ROLLING RACK OPEN

1. As play operation is continued even when the door is opened, disc exchange is possible even during playback, but as the rolling rack with the mechanism behind it can not be tilted, the discs in that rack can not be exchanged.
2. While the door is open, the number of the rolling rack which can not be tilted is displayed on the 7-segment display. (Only "RACK" is displayed when all racks can be tilted.)

With open door



(The number of the rack which can not be tilted is shown.)

3. When the door is opened during selection or loading the operation will be interrupted temporarily. The operation will be started again after confirmation that the door has been closed.
   Accordingly, when the <PLAY> key or the <RANDOM> key is pressed while the door and the rolling rack is open, play operation will not begin. Play will be started after confirmation that the door has been closed.
4. When a rolling rack is tilted, the disc existence information for that part, the program write information, and the random erasure information are cleared. (The customer writing information is not cleared.)
   When at this time all written information is cleared in <PROGRAM> mode, <ALL> mode will be entered.

7.4 PAUSE (Product, Remote Control)

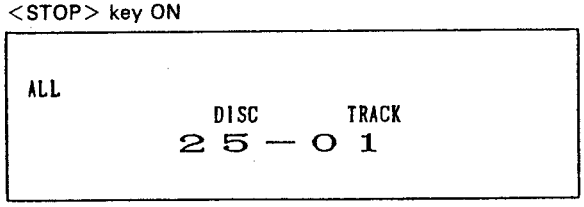
1. When the <PAUSE> key is pressed during play, the PAUSE segment will light and pause will be executed at that location.
   When the <PAUSE> key is pressed during search, pause will be executed at the search completion address.
2. When skip title selection is executed in pause condition, pause will be executed at the search completion address.
3. Pause is cancelled with the <PAUSE> key or the <PLAY> key.

7.5 STOP (Last Disc Memory specification) (Product, Remote Control)

1. When the <STOP> key is pressed during play, the number of the disc played immediately before will be displayed, the disc will be stored, the mechanism will return to the home position, clamping will be executed and stop condition will be reached.

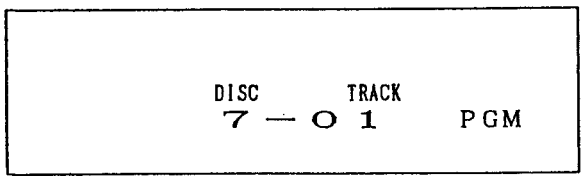
2. When the <PLAY> key is pressed again, the previously played disc will be searched and played (Last Disc Memory).
   When a program has been set up, the number of the first disc in the program will be displayed, and when then the <PLAY> key is pressed, play will start from that disc.

<STOP> key ON



(The number of the disc played immediately before is shown.)

<STOP> key ON (with a program)



(The number of the first disc of the program is shown.)

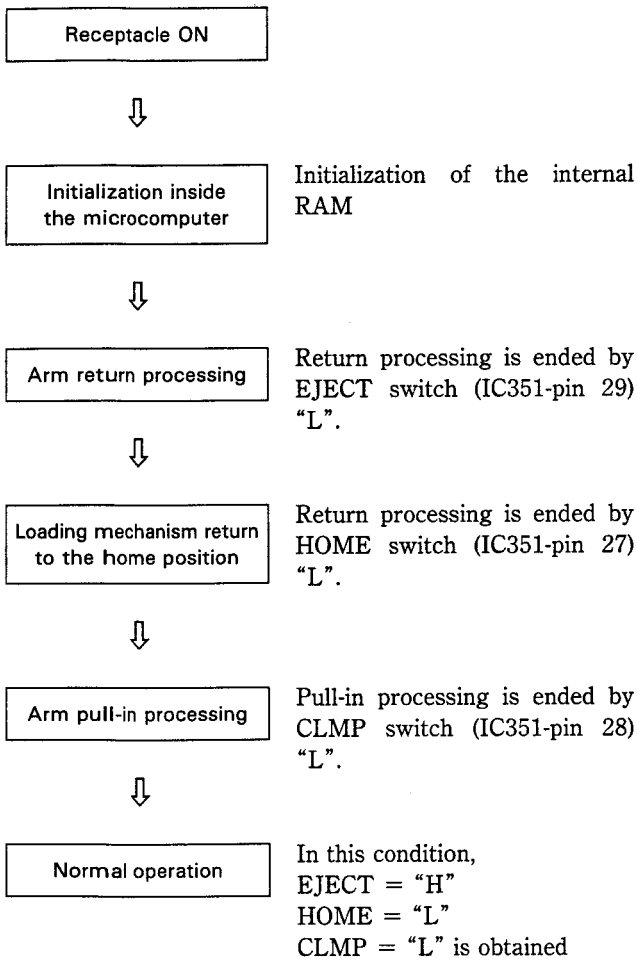
3. Last Disc Memory applies for all modes, <ALL>, <SINGLE>, and <CUSTOM>.
   (However, this applies only for normal play.)
4. When the <STOP> key is pressed during repeat or pause ON, repeat or pause also will be cancelled.
   When the <STOP> key is pressed during stop in <PROGRAM> mode, <PROGRAM> mode will be cancelled (when a program has been written, this also will be cleared), and <ALL> mode will be entered.

7.6 LIST OF FL DISPLAY CHARACTERS

Display	Contents
OFF	Displayed after the POWER key has been pressed until standby status has been reached.
RACK *	Displayed when the door or the rack is open. * shows the number of the rack where the mechanism is (number of the rack which can not be opened).
RACK	When no number is shown, the mechanism is at the home position. All racks can be opened.
25−no	Displayed when there has been no disc (Example: No 25th disc).
End	Displayed when manual search has been executed to the last disc.
PAUSE	Displayed when PAUSE PGM has been entered by PGM input.
P−**	Display of the entered PGM step when the TOTAL display has been set in PGM mode.
C1−**	Displayed at the time of confirmation of the disc entered in custom mode. (C1 at the time of custom 1 check)

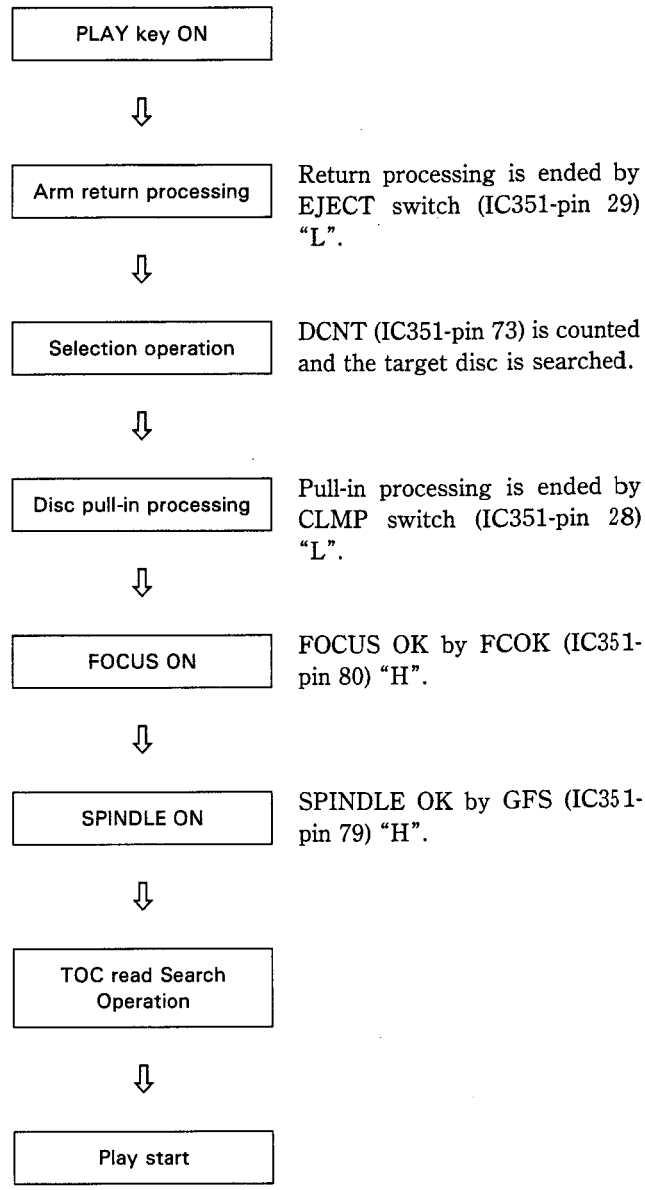
7.7 OPERATION FLOWCHART

1. Sequence at the time of Receptacle ON


Receptacle ON
Initialization inside the microcomputer
Initialization of the internal RAM
Arm return processing
Return processing is ended by EJECT switch (IC351-pin 29) "L".
Loading mechanism return to the home position
Return processing is ended by HOME switch (IC351-pin 27) "L".
Arm pull-in processing
Pull-in processing is ended by CLMP switch (IC351-pin 28) "L".
Normal operation
In this condition,
EJECT = "H"
HOME = "L"
CLMP = "L" is obtained

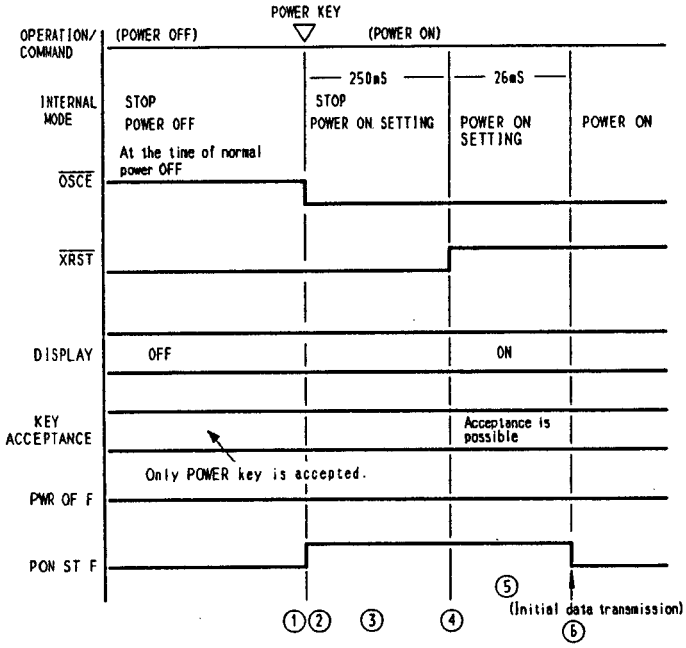
Afterwards, selection and playing is executed by input of the PLAY key etc.
In case of NG for an operation, stop is executed at the respective position if the operation is not completed after several retries.

2. Sequence at the time of Setup (from Mechanism Home Position Standby)


PLAY key ON
Arm return processing
Return processing is ended by EJECT switch (IC351-pin 29) "L".
Selection operation
DCNT (IC351-pin 73) is counted and the target disc is searched.
Disc pull-in processing
Pull-in processing is ended by CLMP switch (IC351-pin 28) "L".
FOCUS ON
FOCUS OK by FCOK (IC351-pin 80) "H".
SPINDLE ON
SPINDLE OK by GFS (IC351-pin 79) "H".
TOC read Search Operation
Play start

3. Power ON/OFF Sequence

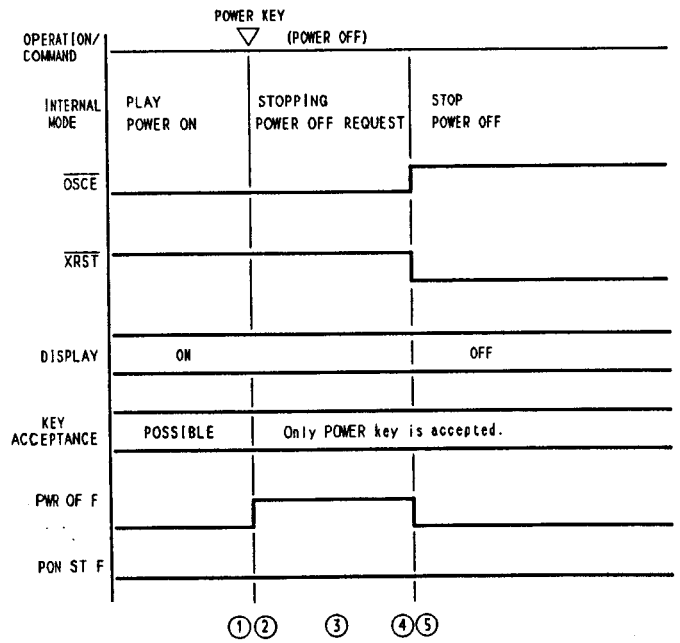
1. $\overline{OSCE}$, $\overline{XRST}$ timing and operation flags at the time of power OFF → power ON



①. Press the POWER key for power OFF.
②. $\overline{OSCE}$ = "L" (LSI oscillation permission) occurs immediately.
③. Waiting for 250 ms.
④. $\overline{XRST}$ = "H" (LSI reset cancellation)
⑤. Waiting for about 26 ms.
⑥. LSI initial setting is executed.

LSI DATA FOLLOW	
CLV−CNT INITIAL	$D6
SERVO Coefficient Specification	$C6
AUDIO CONTROL	$A0
FUNCTION	$9B20
MODE Specification	$81
SERVO OFF	
SP STOP	$E0
BRKOFF	$10
TR−OFF, SL−OFF	$20
FOCUS−OFF	$00
LD OFF	LDON=H
AUTO SEQUENCE OFF	$40

2. $\overline{OSCE}$, $\overline{XRST}$ timing and operation flags at the time of power ON → power OFF



①. Press the POWER key at the time of power ON.
②. Power OFF request flag = "H"
If during play, the mechanism starts to stop.
③. The mechanism returns to the home position, waiting is executed until the end of operation.
④. $\overline{XRST}$ = "L" (LSI reset) after stop completion.
After 100 μs, $\overline{OSCE}$ = "H" (LSI oscillation stop).
⑤. Power OFF request flag = "L"

Data flow at the time of power OFF

In order to prevent run-away of mechanism, LSI, etc. during power OFF, the output of each output port is initialized as follows. Direction follow also is executed.

LDON "H"
LOUT "L", LIN "L", DSRT "L", DSLT "L"
STBL "H", $\overline{XLAT}$ "H", $\overline{DLAT}$ "H", MUTE "H"
$\overline{XRST}$ "L", SYC3 "L", IN1 "L", OUT1 "L"
$\overline{MUTB}$ "L", SCLK "H", DATA "H", CLOK "H"

8. ADJUSTMENTS

■ Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment Items/Verification Items and Order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1−4, the pickup block may be defective.

Step	Item	Test Point	Adjustment Location
1	Focus offset verification	TP1, Pin6 (FCS. ERR)	None
2	Tracking error balance verification	TP1, Pin2 (TRK. ERR)	None
3	Pickup radial/tangential direction tilt adjustment	TP1, Pin1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
4	RF level verification	TP1, Pin1 (RF)	None
5	Focus servo loop gain adjustment	TP1, Pin5 (FCS. IN) TP1, Pin6 (FCS. ERR)	VR152 (FCS. GAN)
6	Tracking servo loop gain adjustment	TP1, Pin3 (TRK. IN) TP1, Pin2 (TRK. ERR)	VR151 (TRK. GAN)

● Abbreviation Table

FCS. ERR : Focus Error
TRK. ERR : Tracking Error
FCS. GAN : Focus Gain
TRK. GAN : Tracking Gain
FCS. IN : Focus In
TRK. IN : Tracking In

● Measuring Instruments and Tools

1. Dual trace oscilloscope (10 : 1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS−7)
4. Low pass filter (39kΩ + 0.001μF)
5. Resistor (100kΩ)
6. 8cm disc (With at least about 20 minutes of recording)
7. Ball point hexagon wrench (GGK1002)
8. Standard tools

● Test Point and Adjustment Variable Resistor Positions

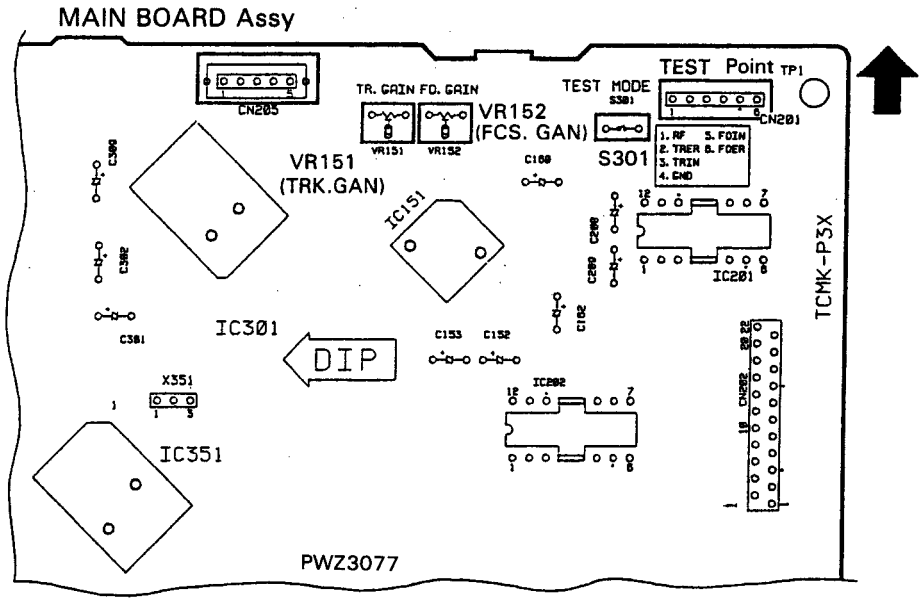


Fig. 1 Adjustment Location

● Notes

1. Use a 10 : 1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10 : 1 probe is used.

● Test Mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Unplug the power cord from the AC socket.
2. Push the test mode switch (S301). (See Fig. 1)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1–3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key Name	Function in Test Mode	Explanation
	MODE	Closes focus servo after the disc is clamped.	After the first disc is clamped, the laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised three times and returned to its original position.
▶	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▮▮	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key Name	Function in Test Mode	Explanation
⏮◀◀ • ◀◀	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶ • ▶▶⏭	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed. After this, return the disc to the rack and the mechanism back to its original position.

Note: Use the first disc in the test mode. (Other discs cannot be selected.)

[How to playback a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

MODE	Lights up the laser diode and closes the focus servo after the first disc has been clamped.
⇩	
PLAY ▶	Starts the spindle motor and closes the spindle servo.
⇩	
PAUSE ❚❚	Closes the tracking servo.

Wait at least 2−3 seconds between each of these operations.

1. Focus Offset Verification

● Objective ● Symptom when out of adjustment	Verify the DC offset for the focus error amp. The model does not focus in and the RF signal is dirty.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin6 (FCS. ERR) [Settings] 5mV/division 10ms/division DC mode	● Player State ● Adjustment Location ● Disc	Test mode, stopped (just the Power switch on) None None needed
[Procedure] Verify the DC voltage at TP1, Pin6 (FCS. ERR) is 0±50mV.			

Note: If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1−4, the pickup block may be defective.

2. Tracking Error Balance Verification

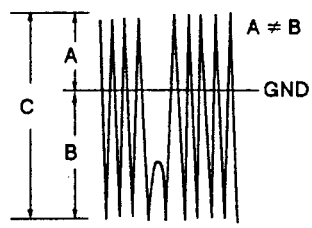
● Objective ● Symptom when out of adjustment	To verify that there is no variation in the sensitivity of the tracking photo diode. Play does not start or track search is impossible.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin2 (TRK. ERR). This connection may be via a low pass filter. [Settings] 50mV/division 5ms/division DC mode	● Player State ● Adjustment Location ● Disc	Test mode, focus and spindle servos closed and tracking servo open. None YEDS−7

[Procedure]

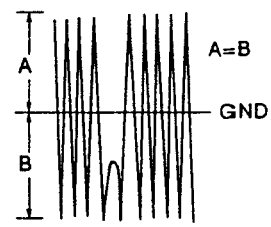
1. Move the pickup to midway across the disc (R=35mm) with the TRACK/MANUAL SEARCH FWD ▶▶ • ▶▶▮ key or REV ▮◀◀ • ◀◀ key.
2. Press the MODE key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Supposing that the positive amplitude of the tracking error signal at TP1, pin2 (TRK. ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.

When $A \geqq B$, $\frac{A-B}{C} \times \frac{1}{2} \leqq 0.1$

When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leqq 0.1$



When there is a DC component



When there is no DC component

3. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin1 (RF). [Settings] 20mV/division 200ns/division AC mode	● Player State ● Adjustment Location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw 8 cm disc [Hewever, those with approx. 20 min of audio signal (music).]

[Procedure]

1. Press the TRACK/MANUAL SEARCH FWD ▶▶ • ▶▶▮ key or REV ▮◀◀ • ◀◀ key to move the pickup to the external circumference of the disc.
   Press the MODE key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with the hexagon wrench (GGK1002) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with the hexagon wrench (GGK1002) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Fig. 3).
   ※ The ball-point type hexagonal wrench is used because the disc will get in the way if a normal hexagonal wrench is used.
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

Note: Radial and tangential mean the directions relative to the disc shown in Fig. 2.

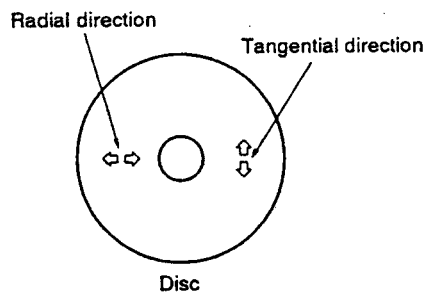
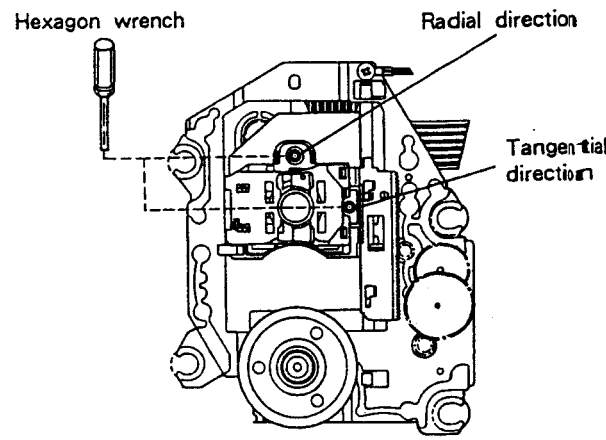


Fig. 2



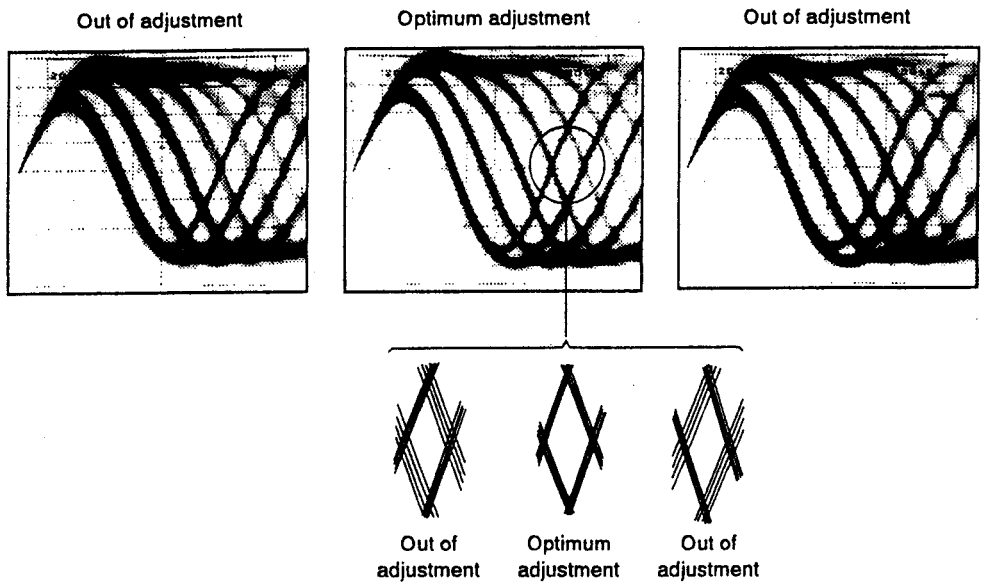


Fig. 3 Eye Pattern

4. RF Level Verification

● Objective	To verify the playback RF signal amplitude.		
● Symptom when out of adjustment	No play or no search		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin1 (RF). [Settings] 50mV/division 10ms/division AC mode	● Player State ● Adjustment Location ● Disc	Test mode, play None YEDS−7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm) with the TRACK/MANUAL SEARCH FWD ▶▶ • ▶▶| key or REV |◀◀ • ◀◀ key, then press the MODE key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the respective servos and put the player into play mode.
2. Verify the RF signal amplitude is 1.2Vp−p±0.2V.

5. Focus Servo Loop Gain Adjustment

● Objective ● Symptom when out of adjustment	To optimize the focus servo loop gain. Playback does not start or focus actuator noisy.		
● Measurement Instrument Connections	See Fig. 4. [Settings] CH1 20mV/division X−Y mode CH2 5mV/division	● Player State ● Adjustment Location ● Disc	Test mode, play VR152 (FCS. GAN) YEDS−7

[Procedure]

1. Set the AF generator output to 1.2kHz and 1Vp−p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ • ▶▶❙ key or REV ❙◀◀ • ◀◀ key to move the pickup to halfway across the disc (R=35mm), then press the MODE key, the PLAY ▶ key, then the PAUSE ❙❙ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

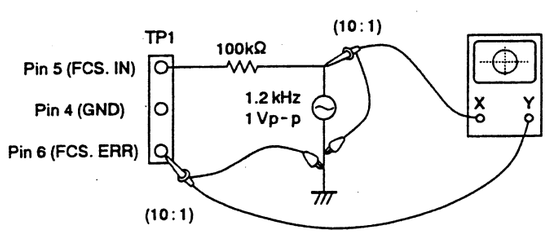
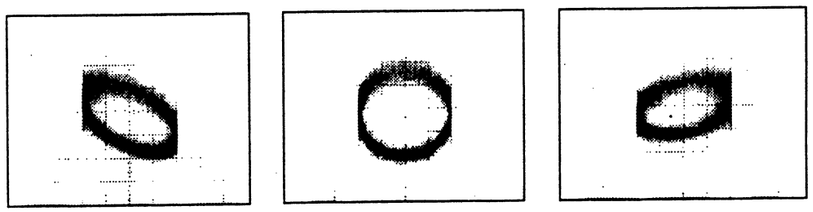


Fig. 4

Focus Gain Adjustment



Higher gain　Optimum gain　Lower gain

6. Tracking Servo Loop Gain Adjustment

● Objective ● Symptom when out of adjustment	To optimize the tracking servo loop gain. Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement Instrument Connections	See Fig. 5. [Settings] CH1 50mV/division X−Y mode CH2 20mV/division	● Player State ● Adjustment Location ● Disc	Test mode, play VR151 (TRK. GAN) YEDS−7

[Procedure]

1. Set the AF generator output to 1.2kHz and 2Vp−p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ • ▶▶❙ key or REV ❙◀◀ • ◀◀ key to move the pickup to halfway across the disc (R=35mm), then press the MODE key, the PLAY ▶ key, then the PAUSE ❙❙ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

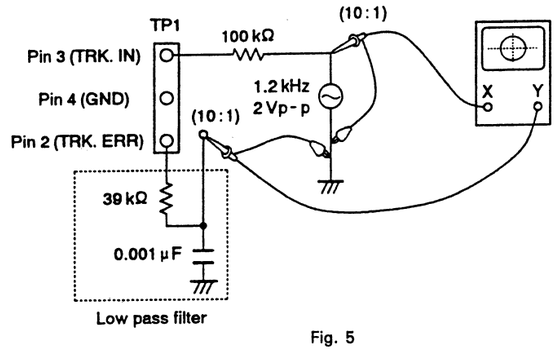
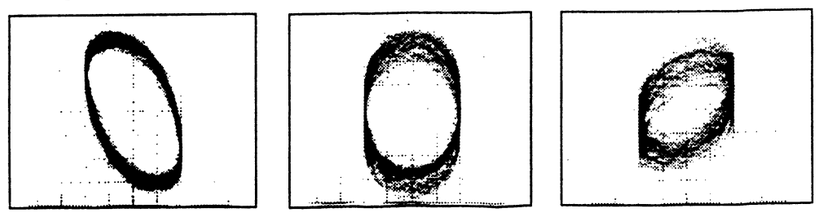


Fig. 5

Tracking Gain Adjustment



Higher gain　Optimum gain　Lower gain

9. SCHEMATIC AND PCB CONNECTION DIAGRAMS

9.1 MECHA BOARD ASSY, SENSOR BOARD ASSY, LOADING BOARD ASSY, SELECT MOTOR BOARD ASSY, LOADING MOTOR BOARD ASSY AND MECHANISM BOARD ASSY

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ← V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦ mA or ← mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - ⌇ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH—□ ON THE SCHEMATIC DIAGRAM:**
   - SCH—□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

MECHANISM BOARD ASSY
- S610 INSIDE SW

MAIN BOARD ASSY
- S301 TEST MODE

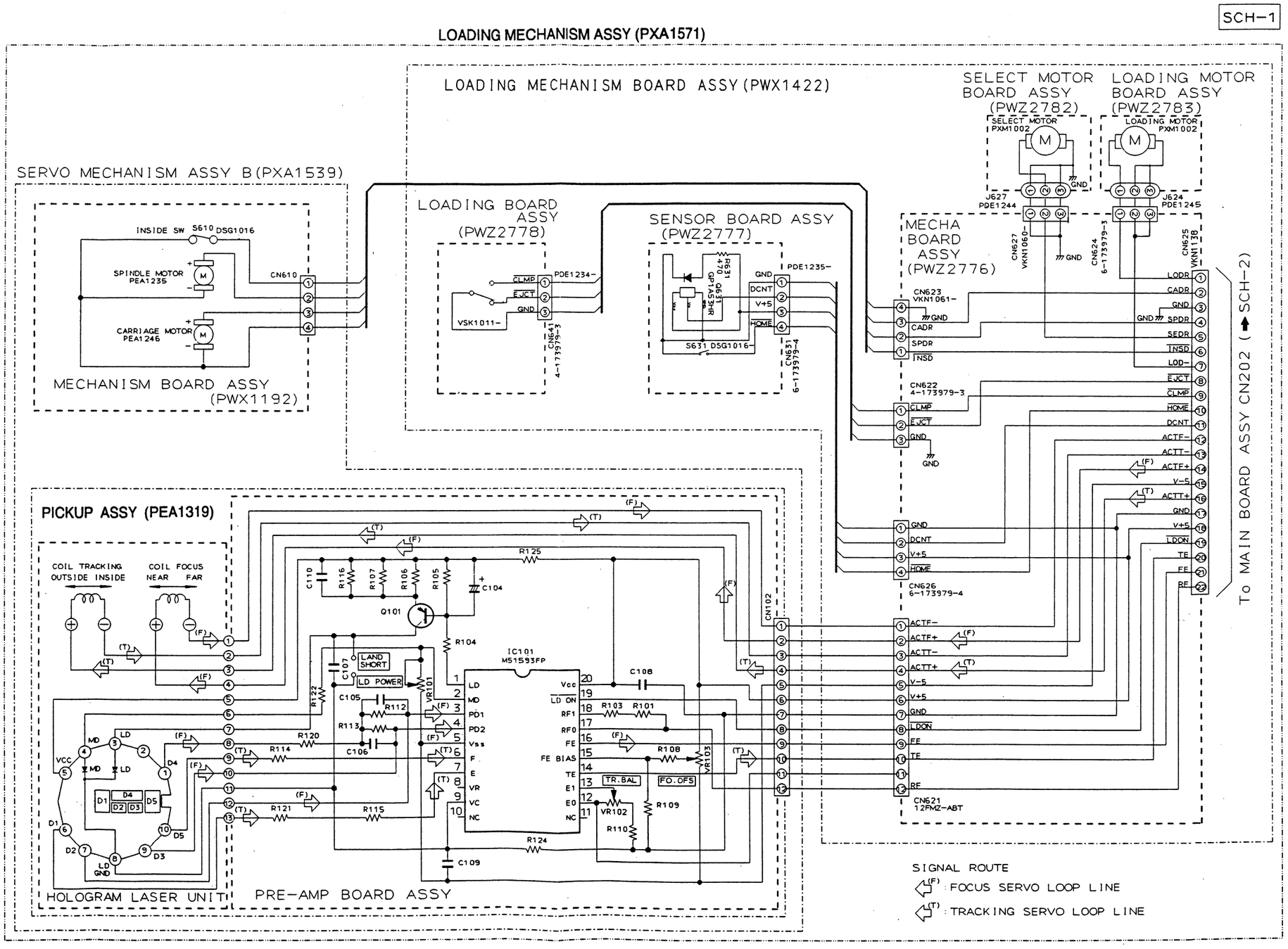
DISPLAY BOARD ASSY
- S703 ⏮◀◀
- S707 PAUSE
- S708 DISC NUMBER —
- S711 ▶▶⏭
- S712 STOP
- S715 PLAY
- S716 DISC NUMBER +

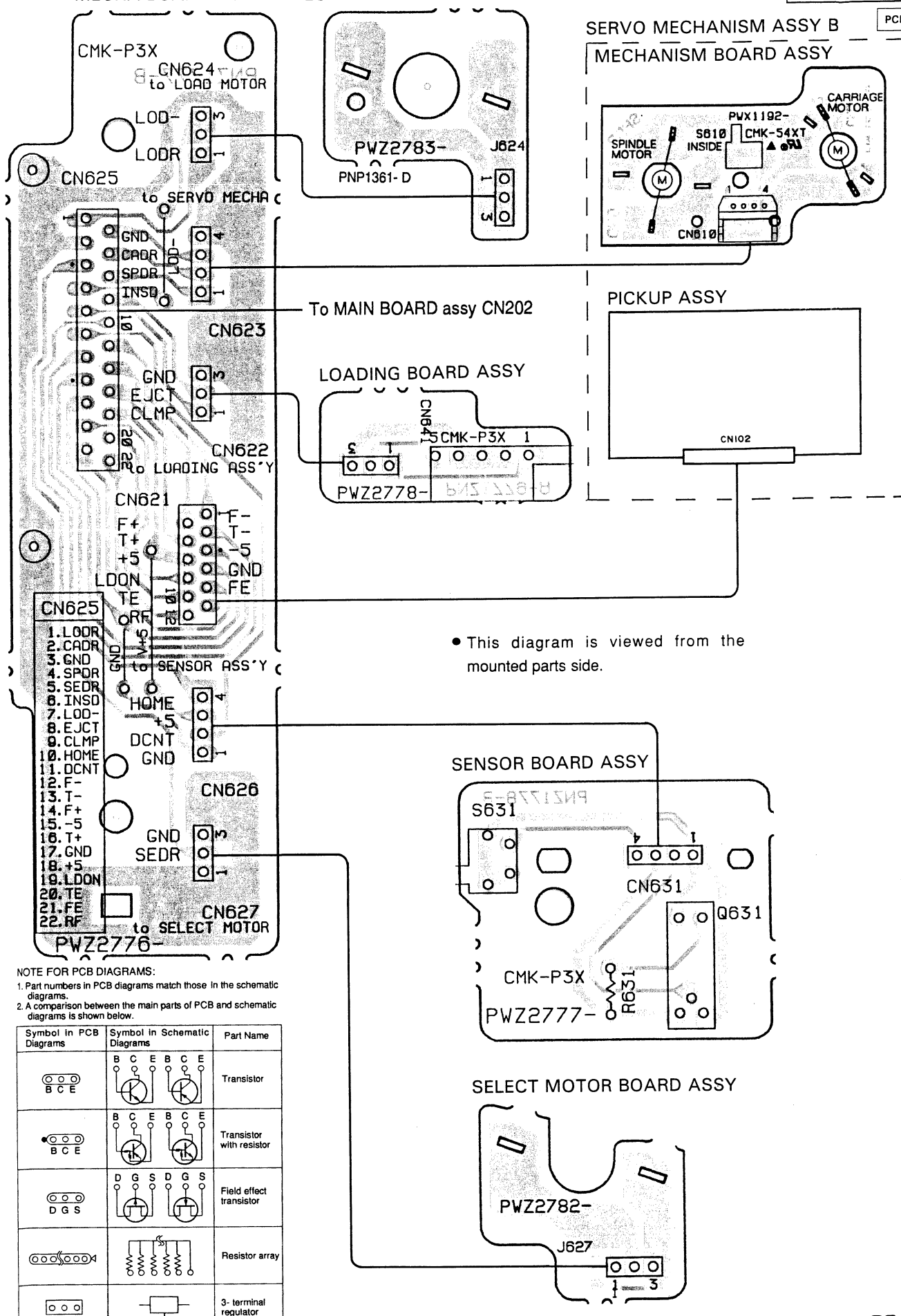
SWITCH BOARD ASSY
- S701 RANDOM
- S702 POWER
- S709 MODE
- S710 CLEAR
- S713 ADLC
- S714 TIME

SENSOR BOARD ASSY
- S631 HOME

RACK BOARD A ASSY
- S651 EJECT
- S652 EJECT

RACK BOARD B ASSY
- S653 EJECT
- S654 EJECT





- This diagram is viewed from the mounted parts side.

NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3- terminal regulator

- This diagram is viewed from the foil side.

CD-ET304

(3). MAIN BOARD ASSY, OUTPUT BOARD ASSY, BACK BOARD A ASSY, BACK BOARD B ASSY AND I/O CONNECTOR BOARD ASSY

- This diagram is viewed from the gray colored foil side.
- This PCB is double side.

MAIN BOARD ASSY

OUTPUT BOARD ASSY

BACK BOARD A ASSY

BACK BOARD B ASSY

I/O CONNECTOR BOARD ASSY

- This diagram is viewed from the foil side.

TO POWER BOARD assy CN11

TO JOINT BOARD assy CN125

TO ESCUTCHEON BOARD assy CN801

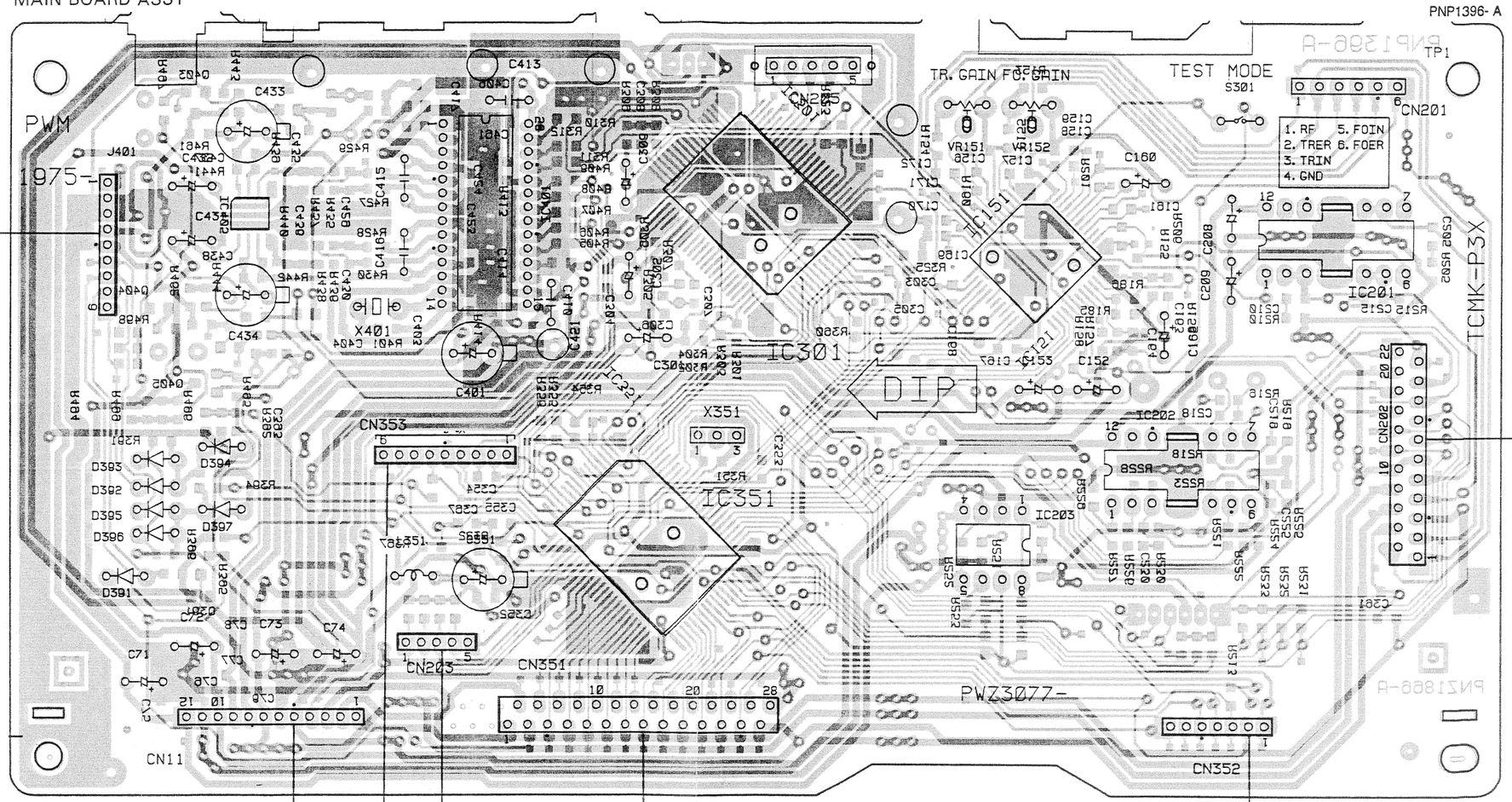
TO MECHA BOARD assy CN852

(2). MAIN BOARD ASSY, OUTPUT BOARD ASSY, RACK BOARD A ASSY, RACK BOARD B ASSY AND I/O CONNECTOR BOARD ASSY

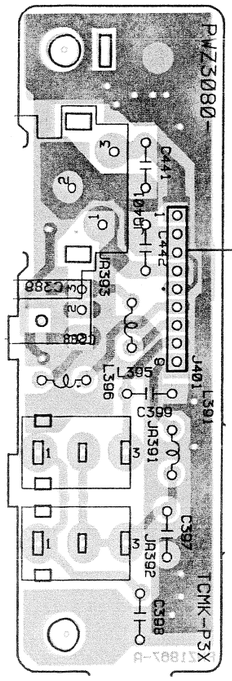
- This diagram is viewed from the pink colored foil side.
- This PCB is double sided.

PCB—2

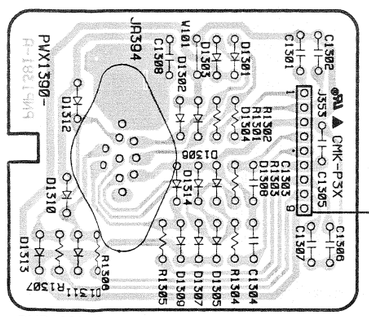
MAIN BOARD ASSY



OUTPUT BOARD ASSY

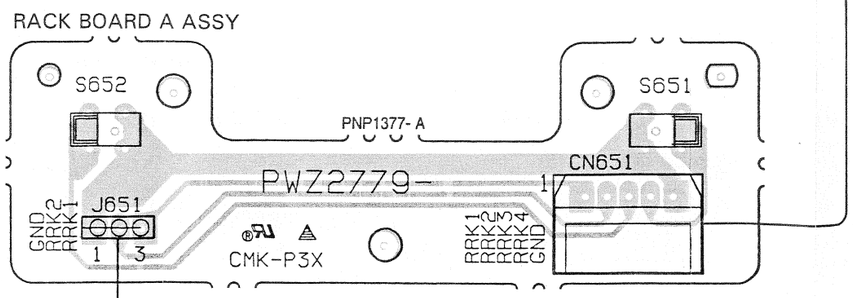


I/O CONNECTOR BOARD ASSY

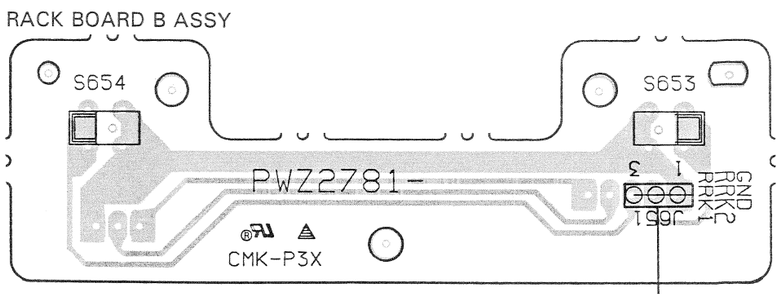


- This diagram is viewed from the mounted parts side.

RACK BOARD A ASSY



RACK BOARD B ASSY



To POWER BOARD assy J11

To JOINT BOARD assy CN752

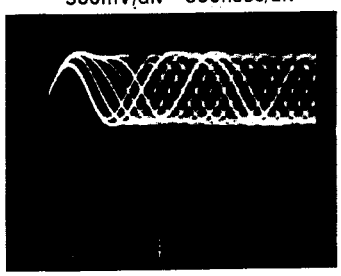
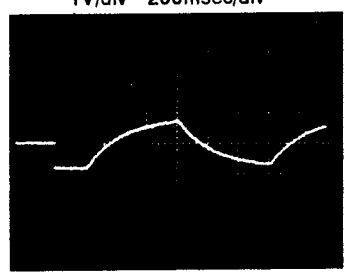
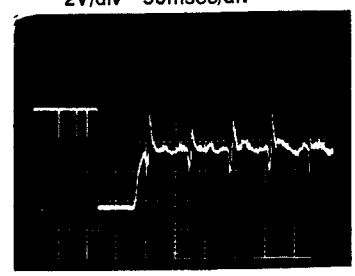
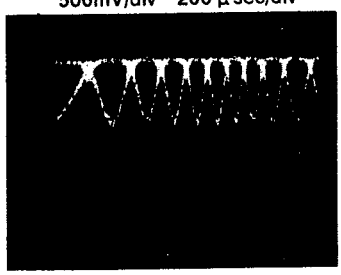
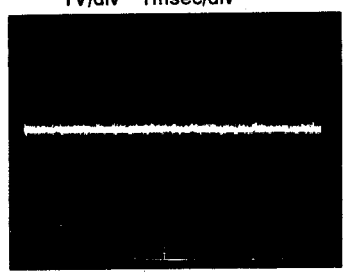
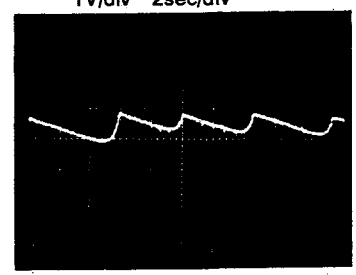
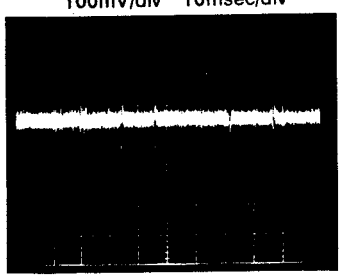
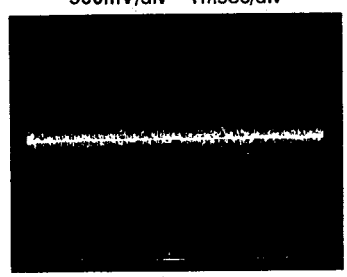
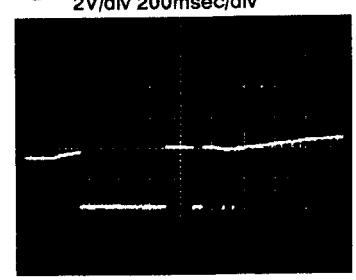
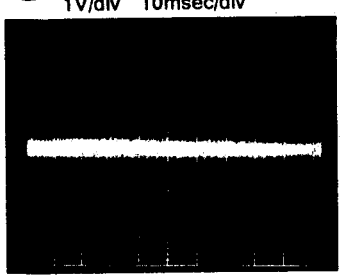
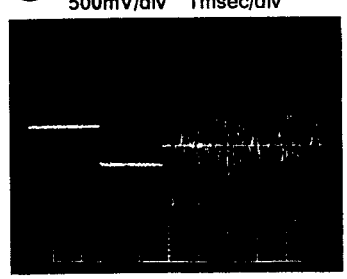
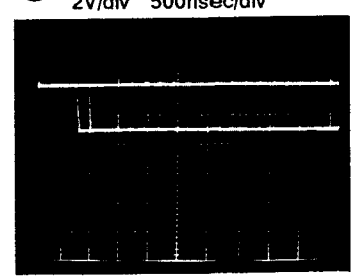
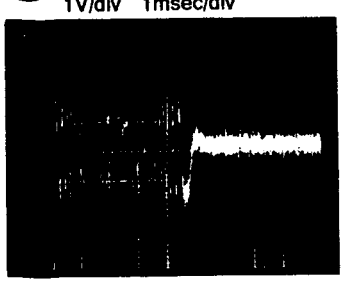
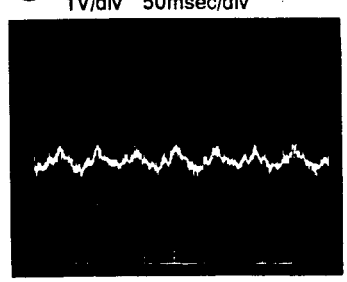
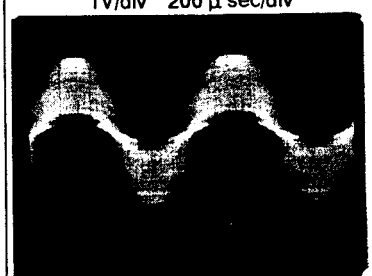
To ESCUTCHEON BOARD assy CN801

To MECHA BOARD assy CN625

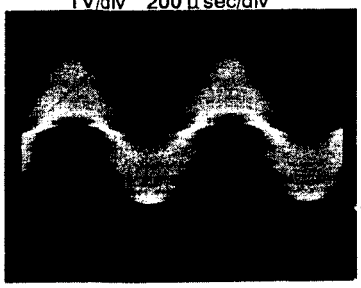
Waveforms

Note: The encircled numbers denote measuring point in the schematic disgram.

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

② TP1 - Pin 1:PLAY MODE (RF) 500mV/div 500nsec/div  – GND	⑤ IC201 – Pin9: FOCUS-IN (*2) MODE (FODR) 1V/div 200msec/div  – GND	⑦ IC202 – Pin9: TRACK SEARCH MODE (SPDR) 2V/div 50msec/div  – GND
② TP1 - Pin 1:TRACK SEARCH MODE (RF) 500mV/div 200 μ sec/div  – GND	⑤ IC201 – Pin9: PLAY MODE (FODR) 1V/div 1msec/div  – GND	⑧ IC201 – Pin4: PLAY MODE (CADR) 1V/div 2sec/div  – GND
③ TP1 - Pin 6:PLAY MODE (FOER) 100mV/div 10msec/div  – GND	⑥ IC201 – Pin3: PLAY MODE (TRDR) 500mV/div 1msec/div  – GND	⑧ IC201 – Pin4: TRACK SEARCH MODE (CADR) 2V/div 200msec/div  – GND
④ TP1 - Pin 2:PLAY MODE (TRER) 1V/div 10msec/div  – GND	⑥ IC201 – Pin3: 50T-JUMP (*1) MODE (TRDR) 500mV/div 1msec/div  – GND	⑨ IC151 - Pin 32:PLAY MODE (EFM) 2V/div 500nsec/div  – GND
④ TP1 - Pin 2:50T - JUMP (*1) MODE (TRER) 1V/div 1msec/div  – GND	⑦ IC202 – Pin9: PLAY MODE (SPDR) 1V/div 50msec/div  – GND	⑩ IC401 - Pin 9:PLAY MODE (1kHz) ($\overline{LO}$) (D/A DATA OUT) 1V/div 200 μ sec/div  – GND

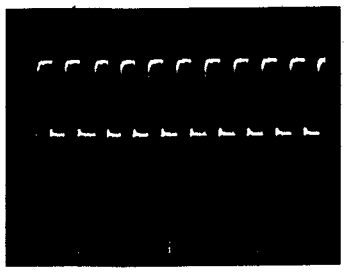
(11) IC401 - Pin 10:PLAY MODE (1kHz)
(LO) (D/A DATA OUT)
1V/div 200 μ sec/div



(22)

(26)

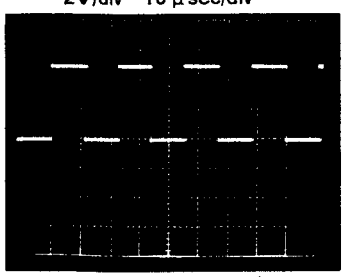
(16) IC301 - Pin 35:PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



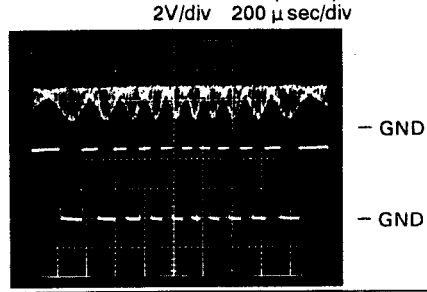
(22)

(27)

(18) IC301 - Pin 32:PLAY MODE (1kHz)
(LRCK)
2V/div 10 μ sec/div

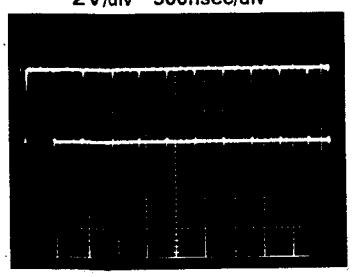


:TRACK SEARCH MODE
(23) Upper:TP1 - Pin 1 (RF) 1V/div
Lower: IC151 - Pin 29 (MIRR)
2V/div 200 μ sec/div

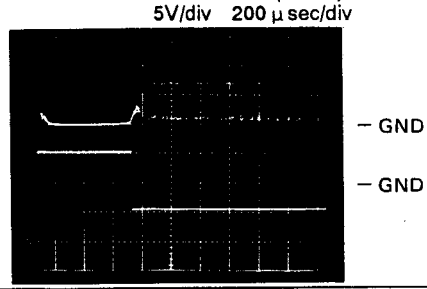


(28)

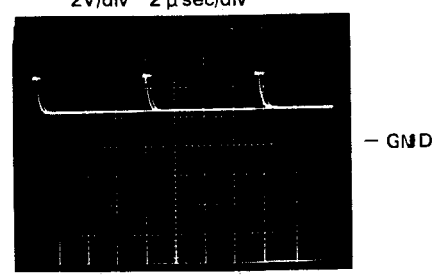
(19) IC301 - Pin 34:PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



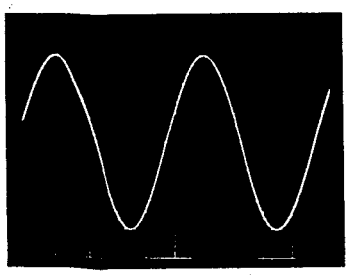
:PLAY MODE
(24) Upper:TP1 - Pin 1 (RF) 1V/div
Lower: IC151 - Pin 30 (DFCT)
5V/div 200 μ sec/div



(33) IC301 - Pin 4:PLAY MODE
(MDP)
2V/div 2 μ sec/div

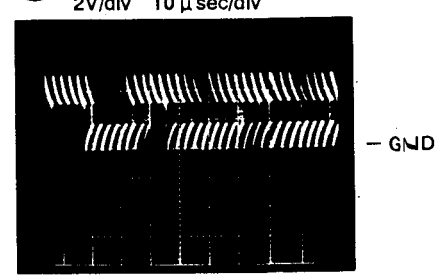


(21) Pin - OUTPUT:PLAY MODE(1kHz)
1V/div 200 μ sec/div



(25)

(53) IC301 - Pin 20:PLAY MODE
(PCO)
2V/div 10 μ sec/div



● IC401
[PD2026B (L)]

Pin No.	Voltage[V]
1	0
2	0
3	5
4	5
5	2. 4
6	2. 6
7	0
8	0
9	2. 6
10	2. 4
11	5
12	0
13	2. 4
14	2. 4
15	5
16	0
17	5
18	0
19	2
20	5
21	5
22	5
23	5
24	5
25	2. 4
26	2. 4
27	2. 4
28	5

● IC301
(CXD2500BQ)

Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	5	31	1.3−2.2	61	0
2	2. 1	32	2. 5	62	2. 5
3	5	33	5	63	0
4	2. 6	34	2. 5	64	0
5	2. 2	35	2. 5	65	0
6	5	36	2. 5	66	3.3−4.8
7	0	37	2. 5	67	5
8	5	38	2. 5	68	0
9	0	39	0	69	2.1−3
10	0	40	5	70	5
11	2. 1	41	2. 5	71	5
12	0	42	5	72	5
13	1	43	2. 5	73	5
14	0.9−1.3	44	0	74	5
15	0	45	5	75	5
16	2	46	4. 4	76	0
17	0	47	0	77	5
18	2. 5	48	0	78	5
19	2. 4	49	0 − 0.3	79	5
20	2. 4	50	1. 2	80	0
21	0	51	1. 2		
22	2. 5	52	0		
23	5	53	2. 5		
24	2. 5	54	2. 5		
25	0. 2	55	0		
26	0	56	2. 9		
27	2. 5	57	2. 5		
28	0	58	2. 5		
29	0	59	0		
30	0	60	0		

● IC201 (LA6520)

Pin No.	Voltage[V]
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0. 1
12	8. 4
FIN	− 8. 2

● IC202 (LA6520)

Pin No.	Voltage[V]
1	0
2	0
3	0
4	0
5	0
6	0
7	1. 7
8	1. 7
9	0.5−0.8
10	0
11	0. 1
12	8. 4
FIN	− 8. 2

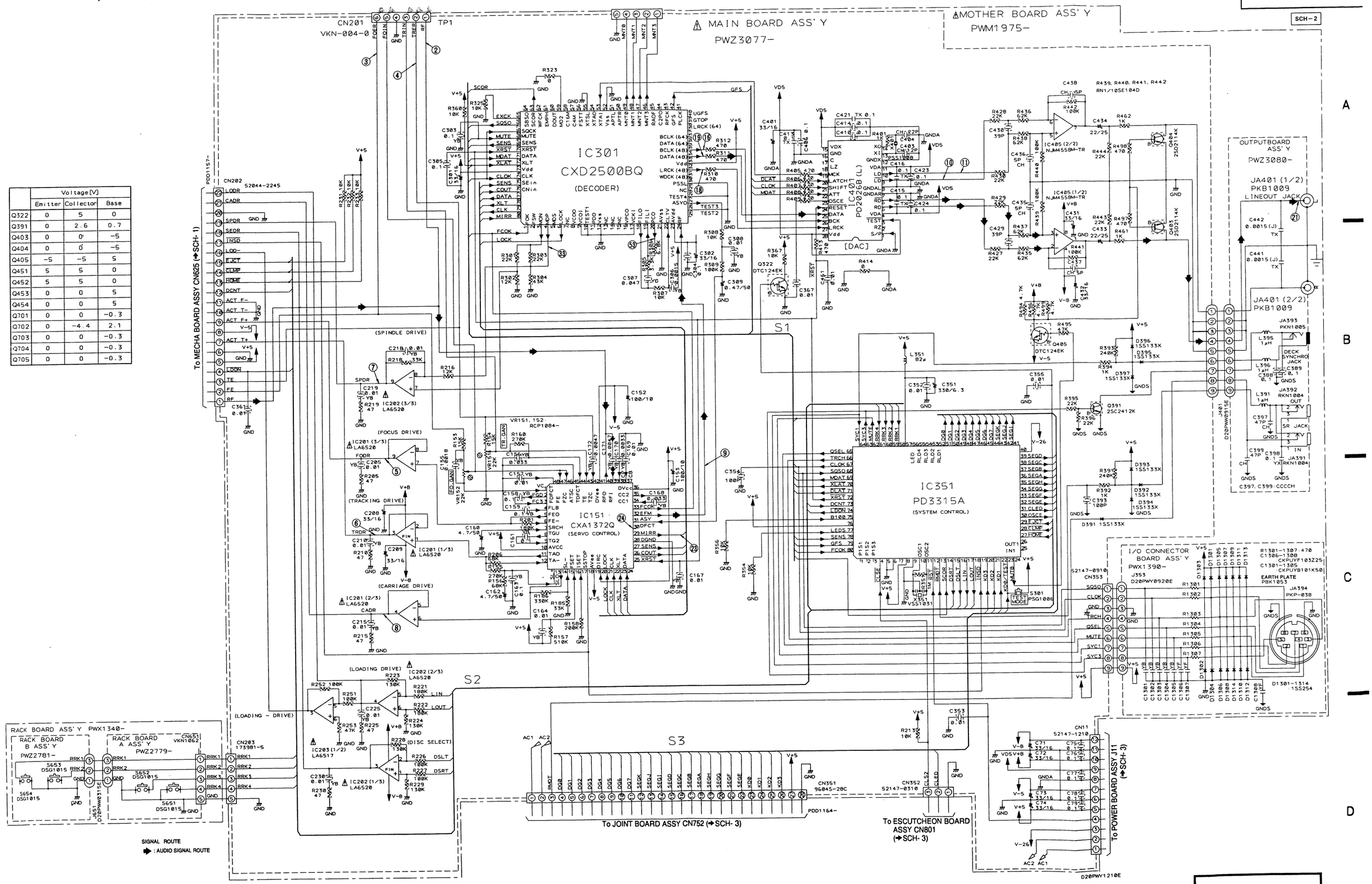
● IC151
(CXA1372Q)

Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	−0.3	29	0
6	0	30	−5
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	−1.5
11	0	35	−1.7
12	0	36	5
13	0	37	−0.7
14	0−0.3	38	−1.5
15	0	39	0
16	−4	40	0.8
17	1.3	41	−5
18	0	42	0
19	−5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

● IC351
(PD3315A)

Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	5	21	0	41	-25.7	61	5
2	5	22	0	42	-25.7	62	0
3	5	23	0	43	-25.7	63	5
4	0	24	5	44	-25.7	64	5
5	0	25	5	45	-25.7	65	5
6	0	26	5	46	-25.7	66	0
7	0	27	5	47	-25.7	67	5
8	5	28	0	48	-25.7	68	5
9	0	29	5	49	-25.7	69	5
10	2.3	30	0	50	-25.7	70	5
11	2.3	31	5	51	-25.7	71	5
12	5	32	-25.7	52	5	72	5
13	5	33	-25.7	53	-0.9	73	5
14	0	34	-25.7	54	-0.9	74	0
15	0	35	-25.7	55	-0.9	75	0
16	0	36	-25.7	56	-0.9	76	5
17	0	37	-25.7	57	5	77	0
18	0	38	-25.7	58	5	78	0
19	5	39	-25.7	59	5	79	5
20	0	40	-25.7	60	5	80	5

	Voltage[V]		
	Emitter	Collector	Base
Q322	0	5	0
Q391	0	2.6	0.7
Q403	0	0	-5
Q404	0	0	-5
Q405	-5	-5	5
Q451	5	5	0
Q452	5	5	0
Q453	0	0	5
Q454	0	0	5
Q701	0	0	-0.3
Q702	0	-4.4	2.1
Q703	0	0	-0.3
Q704	0	0	-0.3
Q705	0	0	-0.3

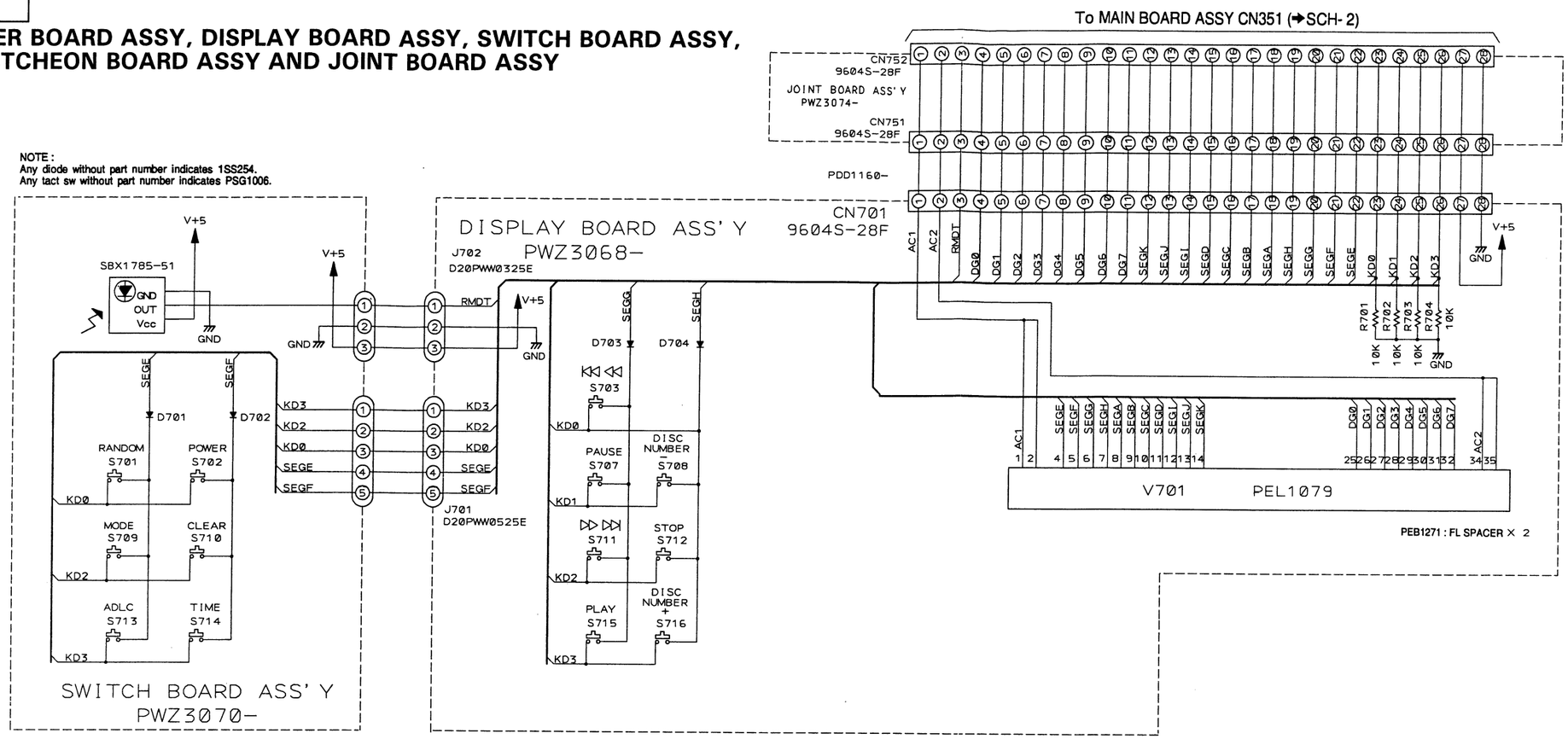


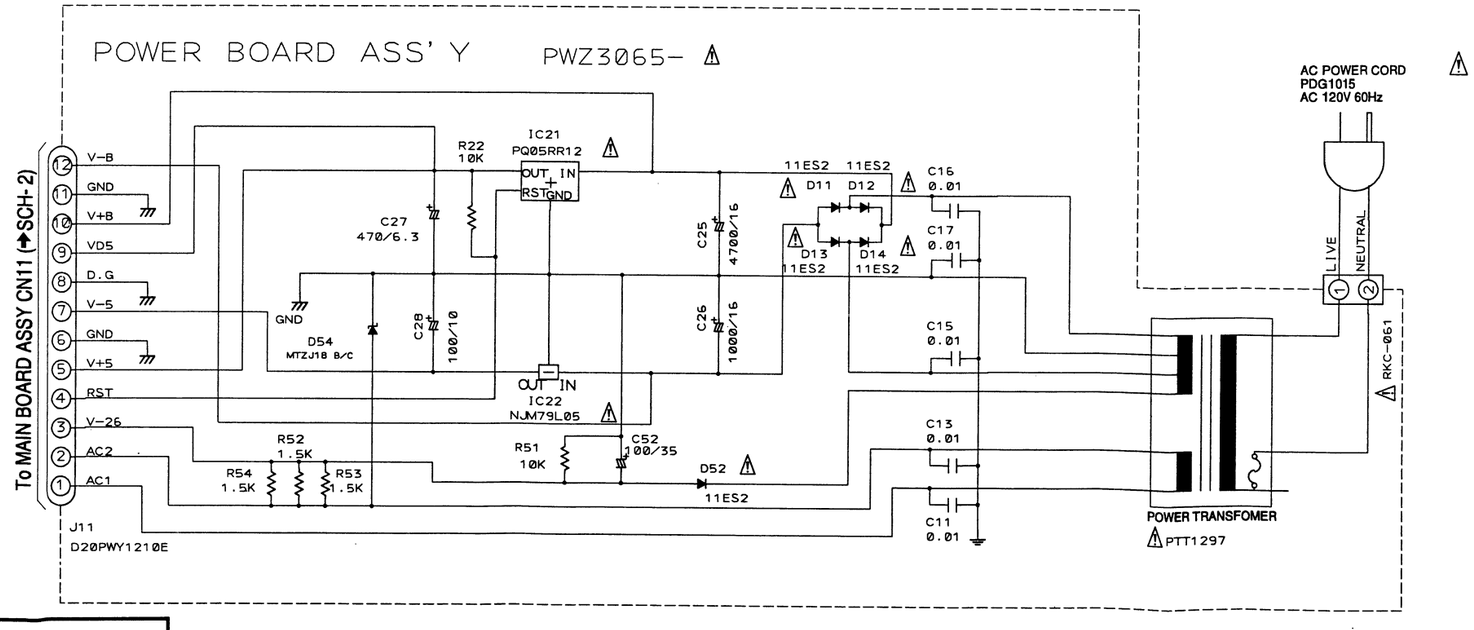
SCH-2 MAIN BOARD ASSY, OUTPUT BOARD ASSY, RACK BOARD A ASSY, RACK BOARD B ASSY, I/O CONNECTOR BOARD ASSY

SCH-2 MAIN BOARD ASSY, OUTPUT BOARD ASSY, RACK BOARD A ASSY, RACK BOARD B ASSY, I/O CONNECTOR BOARD ASSY

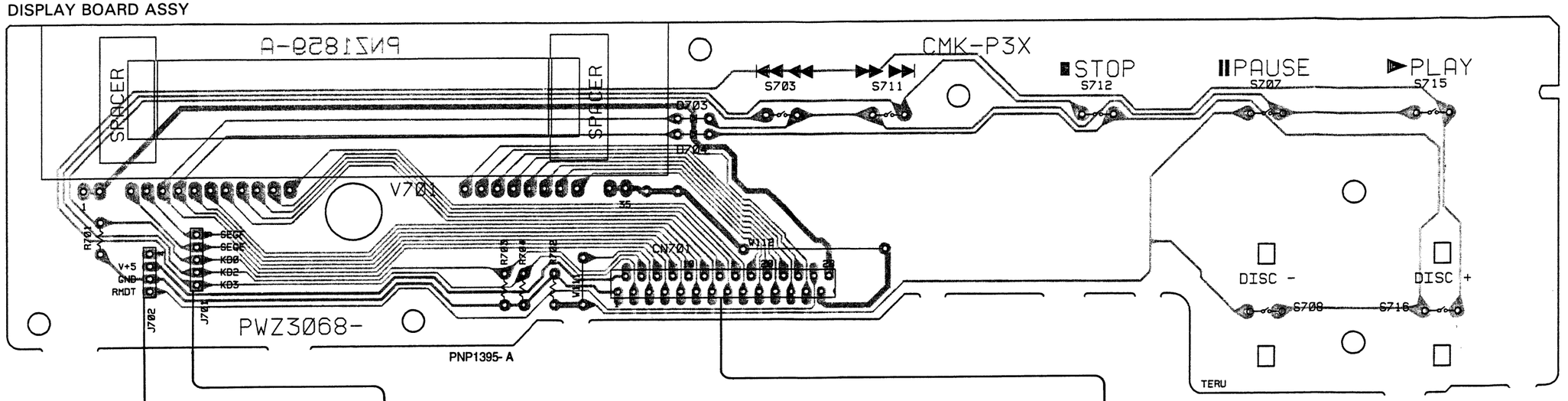
(3). POWER BOARD ASSY, DISPLAY BOARD ASSY, SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY AND JOINT BOARD ASSY

NOTE :
Any diode without part number indicates 1SS254.
Any tact sw without part number indicates PSG1006.

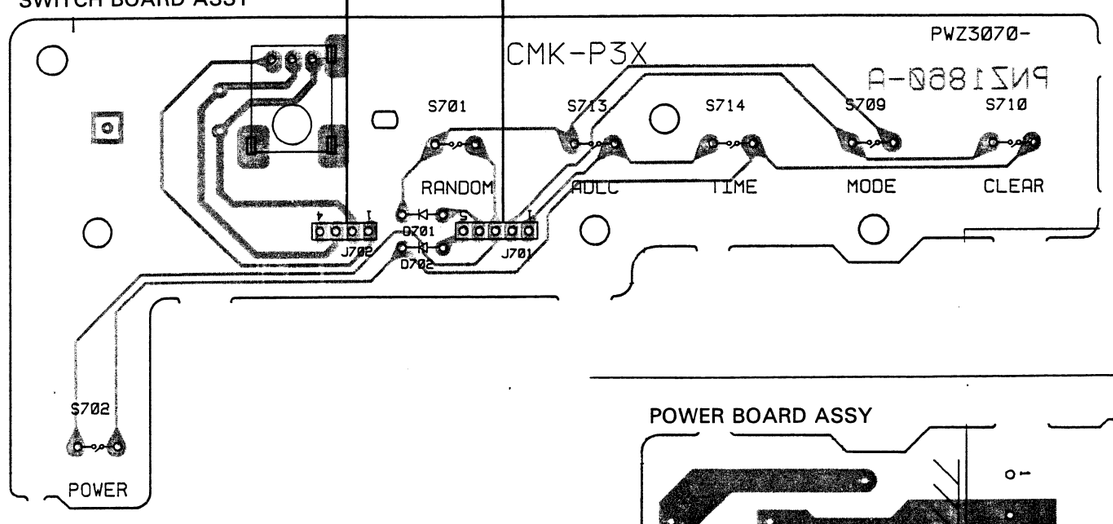




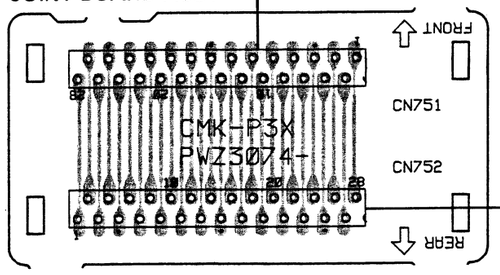
DISPLAY BOARD ASSY



SWITCH BOARD ASSY



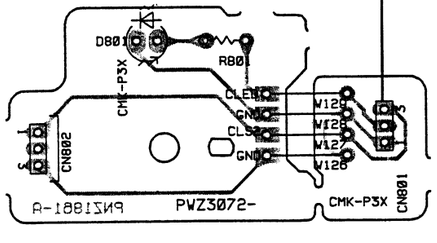
JOINT BOARD ASSY



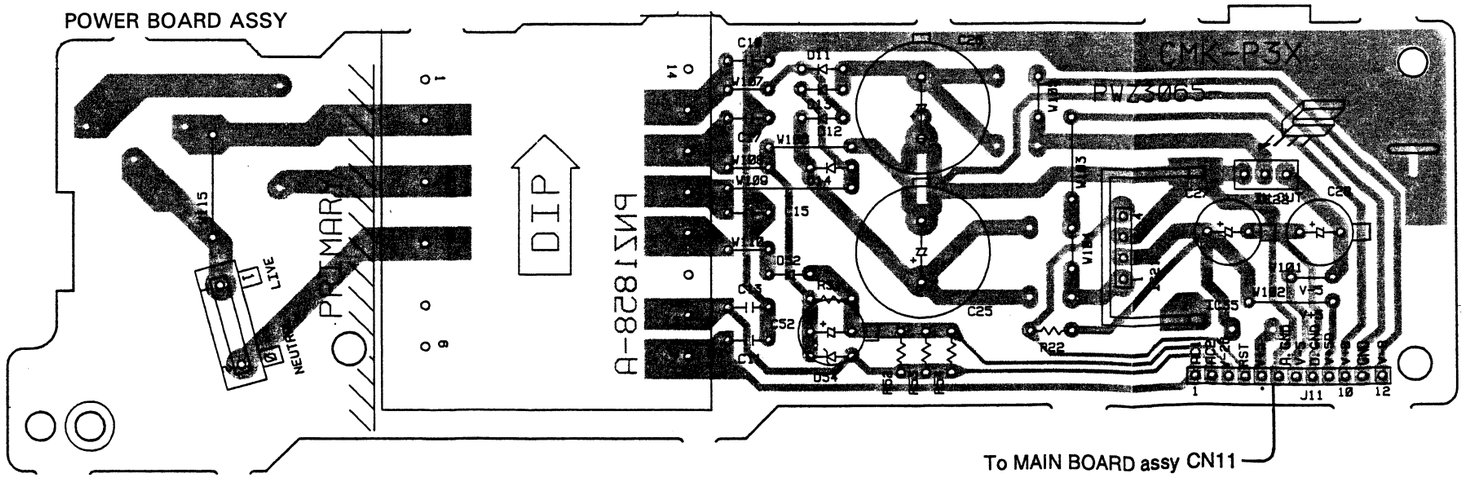
- This diagram is viewed from the mounted parts side.

To MAIN BOARD assy CN352

ESCUTCHEON BOARD ASSY

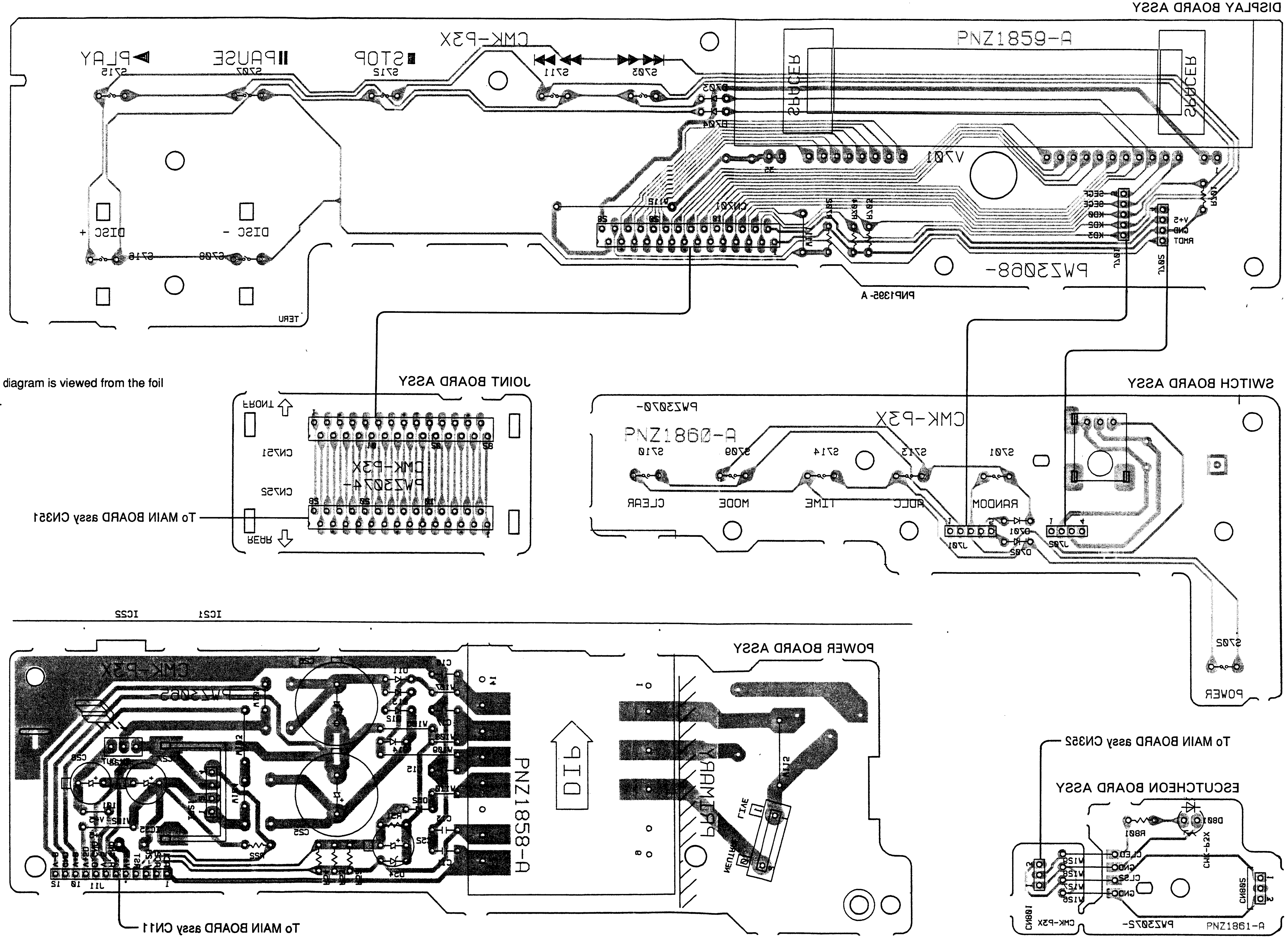


POWER BOARD ASSY

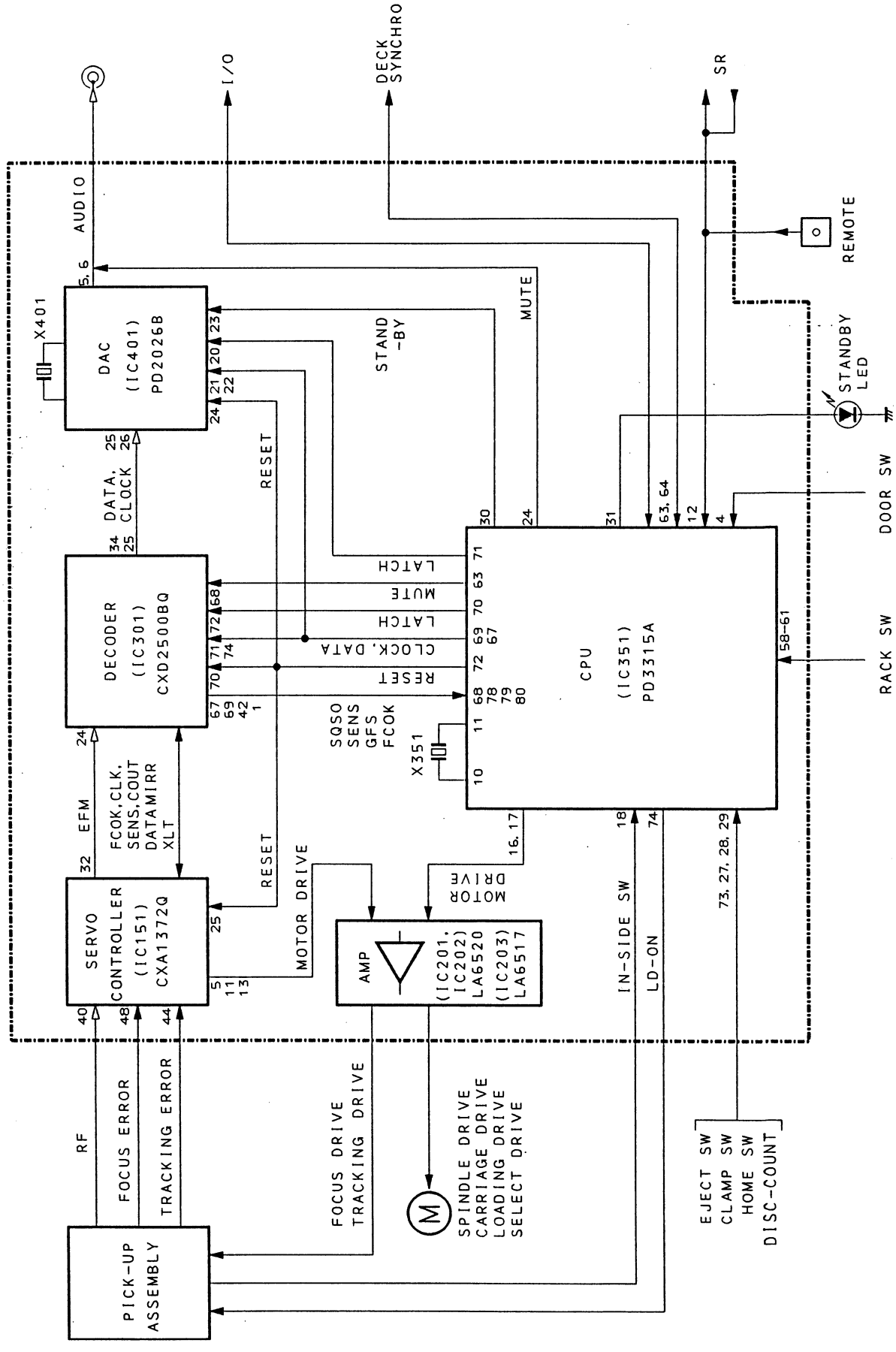


PCB-3

● This diagram is viewed from the foil side.


DISPLAY BOARD ASSY
PNZ1859-A
CMK-P3X
PW23068-
PNP1395-A
SPACER
V701
CN701
J701
J702
PLAY
PAUSE
STOP
DISC +
DISC -
S715
S707
S712
S711
S703
S716
S708
D703
D704
SEGF
SEGE
KD0
KD2
KD3
V+5
GND
RMDT
R701
JOINT BOARD ASSY
FRONT
REAR
CN751
CN752
PW23074-
To MAIN BOARD assy CN351
SWITCH BOARD ASSY
PW23070-
PNZ1860-A
S710
S709
S714
S713
S701
CLEAR
MODE
TIME
ADLC
RANDOM
D701
D702
S702
POWER
IC22
IC21
POWER BOARD ASSY
PW23065-
PNZ1858-A
DIP
PRIMARY
LINE
NEUTRAL
J11
To MAIN BOARD assy CN11
To MAIN BOARD assy CN352
ESCUTCHEON BOARD ASSY
D801
R801
CN801
CN802
CLED
GND
CLS2
PW23072-
PNZ1861-A
CMK-P2X

10. BLOCK DIAGRAM

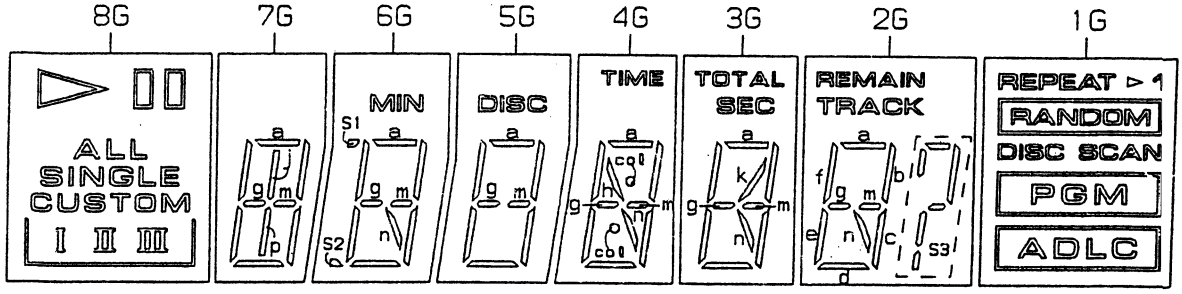


11. FL INFORMATION

■ PEL1079 (V701 : DISPLAY BOARD ASSY)

● FL Tube

● Grid Assignment

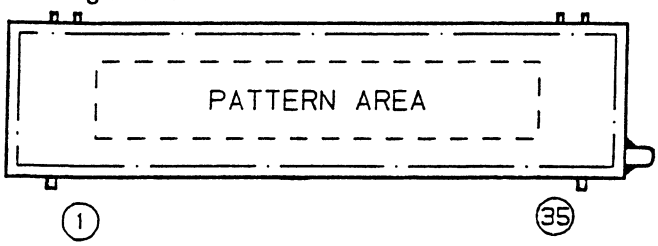


● Pin Connection

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CONNECTION	F1	F1	NP	P5	P6	P7	P8	P1	P2	P3	P4	P9	P10	P11	P12	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	8G	7G	6G	5G	4G	3G	2G	1G	NP	F2	F2

NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) DL ------ Datum Line
4) 1G~8G --- Grid

● Pin Assignment



● Anode Connection

	8G	7G	6G	5G	4G	3G	2G	1G
P1	ALL	a	a	a	a	a	a	RANDOM
P2	SINGLE	b	b	b	b	b	b	-
P3	I	c	c	c	c	c	c	-
P4		d	d	d	d	d	d	ADLC
P5	II	e	e	e	e	e	e	PGM
P6	CUSTOM	f	f	f	f	f	f	DISC
P7	-	g,m	g,m	g,m	g,m	g	g,m	SCAN
P8	-	-	S1,S2	-	col	m	S3	-
P9	III	j,p	n	-	h,n	k,n	n	-
P10	▷	-	MIN	DISC	-	SEC	TRACK	▷1
P11		-	-	-	TIME	TOTAL	REMAIN	REPEAT

12. IC INFOMATION

- *The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.*

■ PD3315A (IC351 : MAIN BOARD ASSY)

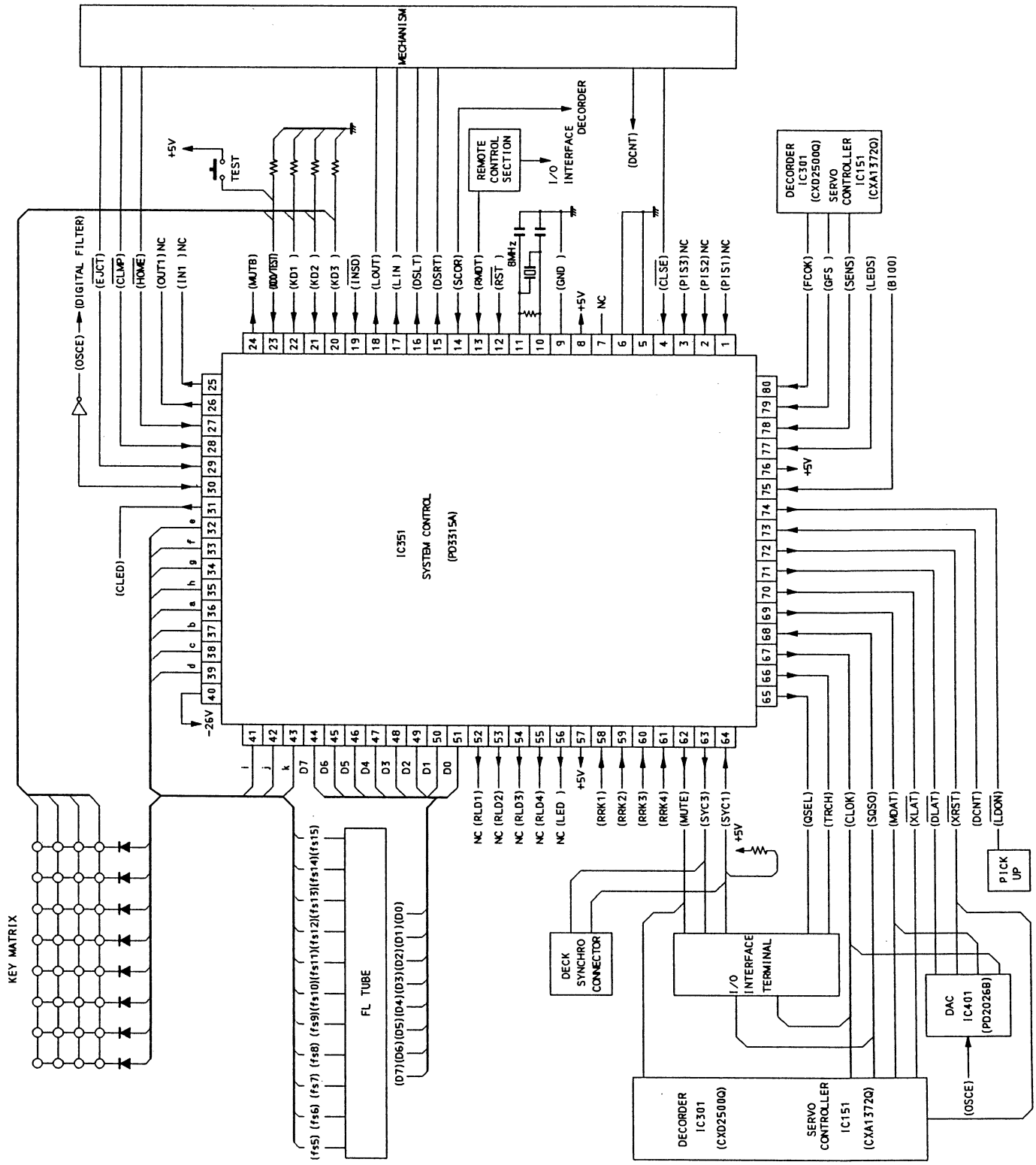
● System Control Micro-computer

● Pin Function

No.	Symbol	Pin Name	I/O	Description
1 | 3	P04/AN4 | P06/AN6	P1S1 | P1S3	I	(+1 disc detection input (only models +1 disc installed) (Not used)
4	P07/AN7	CLSE	I	Door close OK SW (L: Close OK)
5	AVss	No use	GND	(Reference voltage for A/D converter): GND
6	TEST	No use	GND	(Test terminal for maker): GND
7	X2	No use	–	(Sub clock oscillator connected terminal): OPEN
8	X1	No use	+5V	(Sub clock oscillator connected terminal): Vcc
9	Vss	Vss	GND	GND
10	OSC1	OSC1	–	Connected to System clock oscillator (8MHz)
11	OSC2	OSC2		
12	RES	RST	I	CPU reset (L: Reset)
13	P10/IRQ0	RDMT	I	Remote control data input
14	P11/IRQ1	SCOR	I	Sub code sinc S0+S1 input
15	P12/IRQ2	DRST	O	Selector output port Right direction (DRST: H, DSLT: L) Left direction (DRST: L, DSLT: H)
16	P13/IRQ3	DSLT		
17	P14/IRQ4	LIN	O	Loading output port Clump (LIN: L, LOUT: H) Return (LIN: H, LOUT: L)
18	P15/IRQ5 /TMOE	LOUT		
19	P16/EVENT	INSD	I	Slider INSIDE SW input (L: INSIDE)
20 | 22	P33/FS27 | P31/FS25	KD3 | KD1	I	Key • data input
23	P30/FS24	KD0/TEST	I	Key • data input TEST mode request input (H: TEST, L: Normal mode)
24	P47/FS23	MUTB	O	Muting output (L: MUTE)

No.	Symbol	Pin Name	I/O	Description
25	P46/FS22	IN1	O	(+1 disc eject output port Eject (IN1: L, OUT1: H) Load (IN1: H, OUT1: L) (only models +1 disc installed) (Not used)
26	P45/FS21	OUT1		
27	P44/FS20	HOME	I	Disc selector home SW (L: Home)
28	P43/FS19	CLMP	I	Clump SW (L: Clump OK)
29	P42/FS18	EJCT	I	Loading out SW (L: Loading out OK)
30	P41/FS17	OSCE	O	OSCE output (H: when Standby)
31	P40/FS16	CLED	O	LED output for PLAY INDICATOR (LED Blinking: Not home)
32 | 35	P50/FS15 | P53/FS12	SEG E | SEG H	O	Segment output for Fl drive
36 | 39	P54/FS11 | P57/FS8	SEG A | SEG D		
40	P17/Vdisp	Vdisp	I	−26V
41 | 43	P60/FD0/FS7 | P62/FD2/FS5	SEG I | SEG K	O	Segment output for Fl drive
44 | 48	P63/FD3/FS4 | P67/FD7/FS0	D7 | D3	O	Digit output for FL drive
49 | 51	P70/FD8 | P72/FD10	D2 | D0		
52	P73/FD11	RLD1	O	LED output for Rack1(Not used)
53	P74/FD12	RLD2	O	LED output for Rack2(Not used)
54	P75/FD13	RLD3	O	LED output for Rack3(Not used)
55	P76/FD14	RLD4	O	LED output for Rack4(Not used)
56	P77/FD15	LED	O	Output for LED
57	Vcc	Vcc	–	+5V

No.	Symbol	Pin Name	I/O	Description
58	P80	RRK1	I	Rack1 Yes/No SW (L: No) (only models with 100 discs installed)
59	P81	RRK2	I	Rack2 Yes/No SW (L: No) (only models with 100 discs installed)
60	P82	RRK3	I	Rack3 Yes/No SW (L: No) (Rack1 SW for models with 50 discs installed)
61	P83	RRK4	I	Rack4 Yes/No SW (L: No) (Rack2 SW for models with 50 discs installed)
62	P84	MUTE	O	Muting OUTPUT (H: MUTE) (For I/O INTERFACE)
63	P85	SYC3	O	DECK SYNCHRO signal output (For I/O INTERFACE)
64	P86	SYC1	I	DECK SYNCHRO signal input (For I/O INTERFACE)
65	P87	QSEL	O	Signal output for QDATA descrimination (H: During output of Q DATA) (For I/O INTERFACE)
66	P90/PWM	TRCH	O	Data serial output (For I/O INTERFACE)
67	P91/SCK1	CLOK	O	LSI serial clock output (For I/O INTERFACE)
68	P92/SI1	SQSO	I	Sub code Q data serial input (For I/O INTERFACE)
69	P93/SO1	MDAT	O	LSI control data serial output
70	P94/SCK2	XLAT	O	LSI control data lutch pulse
71	P95/SI2/CS	DLAT	O	DAC control data lutch pulse
72	P96/SO2	XRST	O	Reset output for each LSI
73	P97/UD	DCNT	I	Disc count pulse input
74	PA0	LDON	O	Laser diode output (L: ON, H: OFF)

No.	Symbol	Pin Name	I/O	Description
75	PA1	B100	I	Switching port for 50/100 discs mount model (H: 50 discs)
76	AVcc	AVcc	+5V	+5V
77	PO0/AN0	LEDS	I	Switching port for CLED (H: Jointly used for standby)
78	PO0/AN1	SENS	I	LSI operating status multi-mode input
79	PO1/AN2	GFS	I	Frame sync lock input (H: OK)
80	PO2/AN3	FCOK	I	Focus OK input (H: OK)

BLOCK DIAGRAM (System Control Section)